



DIVISION OF AGRICULTURAL SCIENCES
UNIVERSITY OF CALIFORNIA

The California Fresh Deciduous Fruit Industry: Structure, Organization, and Practices

JOHN A. JAMISON

**CALIFORNIA AGRICULTURAL EXPERIMENT STATION
GIANNINI FOUNDATION OF AGRICULTURAL ECONOMICS**

in cooperation with

**MARKETING ECONOMICS DIVISION
ECONOMIC RESEARCH SERVICE, U.S.D.A.**

Giannini Foundation Research Report No. 275
April 1964

FOREWORD AND ACKNOWLEDGMENTS

This report considers one phase of a western regional marketing research project concerned with the broad implications of technical innovations in the marketing of agricultural commodities. In addition to the physical aspects of such developments as bulk handling of fresh fruits and the impact of new techniques on costs and efficiency of handling and shipping, technical changes interact with other trends in marketing, including institutional structure, market organization, and operating practices. These latter considerations as they apply to the California fresh deciduous fruit industry are the principal focus of the study reported here.

The report emphasizes the diverse nature of the production areas and marketing institutions of this industry, particularly as this relates to marketing efficiency and competitive position. Data on the type and amount of fruit handled, the physical plant operated, and the functions performed by California marketing firms provide a basis for evaluating the major elements of market structure, the level of marketing efficiency, and some implications for price and income determination. The study results should aid industry members, research workers, and governmental officials in understanding the ramifications of technical changes and other marketing developments in this and similar industries.

The study was made by the Giannini Foundation of Agricultural Economics, California Agricultural Experiment Station, in cooperation with the Marketing Economics Division, Economic Research Service, U. S. Department of Agriculture. It was part of a contributing study of Regional Research Project No. WM-43, Developments in Structure, Organization, and Technique in the California Fresh Deciduous Fruit Industry and Their Implications for Marketing Efficiency.

The generous contribution of the many members of the California fresh deciduous fruit industry who gave their time for personal interviews and completion of mail questionnaires is gratefully acknowledged. The author expresses his particular appreciation to L. L. Sammet of the Giannini Foundation who guided the project and aided greatly the development of this report. In addition, valuable suggestions and assistance were received from Kenneth R. Farrell of the Giannini Foundation, and Loyd C. Martin, Alden Manchester, and Norris T. Pritchard of the Economic Research Service. These and many others contributed much to the project; however, the author assumes sole responsibility for any errors of fact or judgment that may be present.

TABLE OF CONTENTS

	<u>Page</u>
INTRODUCTION	1
THE DECIDUOUS FRUIT INDUSTRY IN CALIFORNIA	2
Production	4
Acreage and Yield	4
Location of California Acreage	8
Number of Producing Farms	8
Acreage and Production Projections to 1975	12
Utilization--Fresh and Processed	12
Returns to Growers, by Type of Utilization	15
Comparison of California Grower Returns with United States Average	15
Seasonality of Harvesting and Fresh Marketing	18
Trends in Shipping Varieties of Deciduous Fruits	18
Per Capita Consumption of Deciduous Fruits	23
MARKETING INSTITUTIONS: STRUCTURE, ORGANIZATION, AND PRACTICES	27
First Handlers	29
General Organization and Functions	30
Physical Facilities Operated	34
Use of New Handling Techniques	38
Use of Truck Shipment	45
Procurement Sources and Methods	47
Sales Organization and Procedures	49
California Sales Agencies	51
Organization and Functions	51
Procurement Sources and Methods	52
Sales Organization and Procedures	53
Marketing Orders Applicable to California Fresh Deciduous Fruits	54
Legislation and Current Programs	54
Administration and Management of Marketing Orders	56
Operation of Marketing Orders	57
Major Marketing Channels	60
Location of Markets	60
Sales Outlets Used	67
Difference in Sales Outlets Used Among Handler Categories	69

	<u>Page</u>
Changes in Types of Sales Outlets Used	69
Differences in Sales Outlets Used by Agencies	69
SUMMARY--PRODUCTION, UTILIZATION, AND MARKETING INSTITUTIONS	70
COMPETITIVE POSITION OF THE INDUSTRY	75
Market Structure Analysis	75
Definition of the Industry	77
MAJOR ELEMENTS OF MARKET STRUCTURE AND ORGANIZATION	78
Degree of Seller Concentration	78
Distribution of Tonnage--First Handlers	78
Distribution of Tonnage--Sales Agencies	80
Distribution of Tonnage Among Districts	80
Other Factors Relating to Sales Control	84
Product Differentiation	86
Grading and Inspection	87
Methods of Packing, Handling, and Shipping	87
Reputation and Years in Business	88
Brand Name Advertising	88
Summary--Product Differentiation in This Industry	88
Condition of Entry	89
Investment Requirements	89
Control of Strategic Resources	91
Product Differentiation	92
Economies of Scale	92
Summary--Entry Conditions in This Industry	93
Extent of Integration	93
Coordination with the Wholesale and Retail Levels	95
Coordination Among Sales Agencies, First Handlers, and Producers	95
THE IMPACT OF MARKET STRUCTURE AND ORGANIZATION ON PRICE DETERMINATION	96
Number and Size of Buyers and Sellers	97
Organization and Types of Buyers and Sellers	101
Availability of Market Information	102
Summary--Structure and Organization in Relation to Price Determination	103
MARKETING EFFICIENCY IN THIS INDUSTRY	104

	<u>Page</u>
Scale of Operations	105
Utilization of Facilities	111
Timing and Length of Annual Operating Season	112
Utilization of Cold Storage Facilities	112
Composition of Total Pack--First Handlers	114
Size of Supply Area for First Handlers	117
The Relationship of Facilities Utilization to Operating Costs	117
Utilization of New Techniques	119
Barriers to the Adoption of Technical Changes	122
Marketing Coordination	125
Summary--Structure and Organization in Relation to Marketing Efficiency	125
THE IMPACT OF MARKET STRUCTURE AND ORGANIZATION ON INDUSTRY INCOMES .	128
Producer Incomes	128
First-Handler Incomes	131
Sales Agency Incomes	132
SUMMARY AND CONCLUSIONS	132
Implications for Future Developments	138
APPENDIX A	141
APPENDIX B	159

LIST OF TABLES

<u>Table</u>		<u>Page</u>
1	Cash Receipts, Selected Deciduous Fruits, United States and California, 1959	3
2	California Production as a Percentage of Total United States Production, Selected Deciduous Fruits, 1924-1927, 1938-1941, and 1957-1960	6
3	Total Acreage Composition, Selected Deciduous Fruits, California, 1927 and 1959	7
4	Yield Per Bearing Acre, Selected Deciduous Fruits, California, 1924-1927 and 1957-1960	9
5	Total Acreage, by Crop Reporting Districts, Selected Deciduous Fruits, California, 1940 and 1960	10
6	Number of Farms Harvesting Selected Deciduous Fruits, California, 1954 and 1959	11
7	Projections of California Yields, Acreage, and Production for Selected Fruits with Alternative Assumptions as to California's Share of United States Production, 1975	13
8	Changes in Tonnage of Selected Deciduous Fruits Utilized Fresh and Processed, California, 1937-1939 to 1957-1959	14
9	Gross Returns Per Ton to Growers from Processing as a Percentage of Gross Returns Per Ton to Growers from Fresh Utilization, Selected Deciduous Fruits, California, 1927-1929, 1937-1939, 1957-1959	16
10	Comparison of United States and California Prices Received by Growers, Selected Deciduous Fruits, 1924-1927, 1938-1941, and 1957-1960	17
11	Estimated Length of Safe Storage Periods, Selected Fresh Deciduous Fruits	20
12	California Fresh Deciduous Fruit Shipments, 1959-60 Shipping Season, by Months	21
13	California Out-of-State Shipments, Selected Fresh Deciduous Fruits, by Varieties, 1935-1937 and 1958-1960	24
14	Interstate Shipments of Fresh Plums by Variety, California, 1935-1937 and 1958-1960	25
15	Average Per Capita Consumption, Fresh and Total, Selected Deciduous Fruits, United States, 1924-1927, 1946-1948, and 1956-1958	26
16	Distribution of Total Tonnage and Tonnage of Each Type of Fruit Among the Different Types of First-Handling Firms, California, 1959	31
17	Characteristics and Functions of First-Handling Firms, by District, Type of Fruit Handled, and Cumulative Size Group, California, 1960	33

<u>Table</u>		<u>Page</u>
18	Percentage of Fresh Deciduous Fruits House Packed and Field Packed by Districts, California, 1960	35
19	Percentage of Interviewed First-Handling Firms Utilizing Various Types of Equipment for Principal Packinghouse Operations	37
20	Average Capacities and Percentage of First-Handling Firms Operating Cold Storage and Precooling Facilities by District, Type of Fruit Handled, and Cumulative Size Group, California, 1960	39
21	Number of First-Handling Firms Prepackaging and Types of Fruit Prepackaged by District, California, 1959	40
22	Number of First-Handling Firms Prepackaging by Cumulative Size Group, California, 1959	41
23	Number of First-Handling Firms Using Bulk Bins, and Type of Use by District and Cumulative Size Group, California, 1960	44
24	Percentage of Total Fresh Tonnage Shipped by Truck, Selected Deciduous Fruits, California, 1959-60 Season	46
25	Procurement Sources and Methods of First-Handling Firms by District, Type of Fruit Handled and Cumulative Size Group, California, 1960	48
26	Shipping Limitations Imposed Under the Federal Marketing Order for Tokay Grapes, 1948-1955	59
27	Change in Percentage of Total California Deciduous Fruits Sold Fresh, Out of State, by Type of Fruit, 1937-1939 to 1957-1959	63
28	Sales of First-Handling Firms: Markets and Sales Outlets Used and Share Sold by Sales Agencies, by District, Type of Fruit Handled, and Cumulative Size Group, California, 1959	64
29	Interstate Rail Passings and Unloads in Major United States Cities, Selected California Fresh Deciduous Fruits, 1960	65
30	Truck and Rail Carlot Unloads at Los Angeles and San Francisco, Selected California Fresh Deciduous Fruits, 1960	66
31	Distribution of Total Tonnage and Tonnage of Each Type of Fruit Among First-Handling Firms by Cumulative Size Groups, California, 1959	79
32	Total Fresh Disappearance of Selected Deciduous Fruits and Shares Sold by Major Sales Agencies, California, 1959	81
33	Distribution of Total Tonnage and Tonnage of Each Type of Fruit Among Shipping Districts, California, 1959	82
34	Tonnage of Each Type of Fruit Shipped as a Percentage of Total Tonnage Shipped from Each District, California, 1959	83
35	Percentage of Total Tonnage of Fresh Deciduous Fruits in Each District Handled by the 4 Largest Volume First-Handling Firms in the District, 1959	85

TablePage

36	Consumer Expenditures for Fresh Fruits Sold in Food Stores, United States, 1955-1960	98
37	Sales of 20 Largest Chains as a Percentage of Total United States Grocery Store Sales and as a Percentage of Total Food Sales in Their Operating Areas	99
38	Capacity Rates of Output of Packed Fresh Deciduous Fruits in Various Containers, California Packinghouses, 1960	109
39	Capacity Hourly Rate of Output of Packed Fruit by a Percentage of Plants Indicating Specified Rates, California, 1960	110
40	Typical Length of Packing Season of Tree Fruit and Grapes by First-Handling Firms, by District, California	113
41	Percentage of First-Handling Firms Handling Each Type of Fruit and the Composition of Their Total Pack, California, 1959	115
42	Number of Types of Fruit Handled by California First-Handling Firms, by District, 1959	116
43	Length of Haul from Orchard or Vineyard to Packinghouses, California First-Handling Firms, by District	118

LIST OF FIGURES

<u>Figure</u>		<u>Page</u>
1	California Production of Selected Deciduous Fruits, Five-Year Averages, 1925-1929 to 1955-1959 and 1960	5
2	Typical Harvesting Dates and Fresh Marketing Periods, Selected California Deciduous Fruits, by District	19
3	Fresh Deciduous Fruit Shipping Districts, California, 1960 . .	28
4	Marketing Channels, California Deciduous Fruits, 1959	61
5	Average Costs of Packing Fresh Plums, Pears, and Grapes in Relation to Hours of Operation Per Season, Under Assumed Conditions	106
6	Packing and Container Material Costs in Relation to Type of Assembly, Shipping, and Cannery Container, California Fresh Pears, 1959	121
7	Packinghouse Cost in Packing Fresh Pears in Relation to Plant Capacity and Packing Container, California, 1959	123
8	Average Costs of Packing Fresh Plums in Relation to Method of Packing, Assuming 20 Percent Cull Rate and 1955 Price Levels .	123

THE CALIFORNIA FRESH DECIDUOUS FRUIT INDUSTRY:
STRUCTURE, ORGANIZATION, AND PRACTICES

by

John A. Jamison^{1/}

INTRODUCTION

Structural and organizational changes have occurred at all levels of the food distribution system during the past few decades.^{2/} Major developments include the dramatic increase in scale of operation at the retail level and greater coordination among different segments of the distribution channel. Within individual firms there have been changes in policies, methods and scale of production, and management techniques. These shifts are both outgrowths of and contributors to technical changes, such as new methods and equipment for materials handling and packaging.

This study is concerned with these aspects of change in the California fresh deciduous fruit industry. Descriptive information about the production and utilization patterns for these fruits and the current nature of marketing institutions have been selected to (1) provide a background for understanding and analysis of recent industry developments, especially those related to its competitive position and marketing efficiency, and (2) provide a basis from which future changes can be measured and evaluated in other studies of this

1/ Formerly Assistant Specialist, Agricultural Experiment Station, University of California, Berkeley, and Cooperative Agent, Economic Research Service, U. S. Department of Agriculture. Since 1962, Research Associate, Food Research Institute, Stanford University.

2/ For recent discussions of these changes, see the following:

George L. Mehren, "The Changing Structure of the Food Market," Journal of Farm Economics, Vol. 39, No. 2, May, 1957, pp. 339-353.

Norman R. Collins and John A. Jamison, "Mass Merchandising and the Agricultural Producer," Journal of Marketing, Vol. 22, No. 4, April, 1958, pp. 357-366.

D. B. DeLoach, "Adapting Market Organization to Changing Requirements," Journal of Farm Economics, Vol. 40, No. 5, December, 1958, pp. 1525-1538.

industry. In the latter sections of the report, the data are utilized in an appraisal of some of the factors bearing on the industry's current competitive position and several aspects of its market performance. Some major structural elements of the markets for these fruits are defined and discussed in terms of their impact on price and income determination.

Many of California's major deciduous fruits can be utilized in either the fresh or processed form. The California fresh deciduous fruit industry is defined in this report as that segment of the industry primarily concerned with marketing these fruits in the fresh form, although the interrelationships with processing outlets must be recognized. Principal attention is focused on two levels of the industry: (1) first handlers (firms operating packing and/or shipping facilities in the state's producing districts) and (2) California sales agencies (selling organizations located in California whose major function is the sale of fresh fruits for first handlers).

The production and utilization data presented describe some of the principal changes and trends that have developed in this industry during the past 25 or 30 years. Shifts in the location of production, increasing yields per acre, and changing shares moving to fresh and processing outlets are among the many factors having important implications for current industry problems.

The nature of marketing institutions is presented in considerable detail. Emphasis is on the differences among the types of firms, facilities, and practices that characterize the industry. The available data have been classified so as to point up numerous aspects of structure and organization that bear on the market performance of the industry.

THE DECIDUOUS FRUIT INDUSTRY IN CALIFORNIA

Cash farm marketings of deciduous fruits grown in California (including apples, apricots, cherries, grapes, nectarines, peaches, pears, plums, and prunes) amounted to \$327,200,000, or 10.9 percent of the state's total farm marketings in 1959. Marketings of these fruits produced in the United States in that year were \$687,100,000; thus, California production accounted for 47.6 percent of the nation's total (Table 1).

The importance of this industry in the state's economy greatly exceeds the level of cash farm marketings. As shown in a recent study of the economic significance of the pear industry in local communities, California's 1959 pear

TABLE 1

Cash Receipts, Selected Deciduous Fruits, United States and California, 1959

Fruit	United States		California		California cash receipts as a percentage of United States receipts
	Cash receipts	Percentage of total cash receipts from farming	Cash receipts	Percentage of total cash receipts from farming	
	million dollars	percent	million dollars	percent	
Apples	197.2	0.6	12.6	0.4	6.4
Apricots	26.7	0.1	23.9	0.8	88.5
Cherries	40.9	0.1	6.0	0.2	14.6
Grapes	171.7	0.5	143.2	4.7	83.3
Nectarines	4.5	-0.05	4.5	0.1	100.0
Peaches	131.5	0.4	52.8	1.7	40.0
Pears	49.4	0.2	27.1	0.9	55.3
Plums and prunes	65.2	0.2	57.1	1.9	87.8
Total	687.1	2.1	327.2	10.7	47.6

Sources: U. S. Agricultural Marketing Service, The Farm Income Situation, FIS-179, July, 1960, pp. 29-30, and Supplement, State Estimates of Farm Income, 1949-59, August, 1960, pp. 53 and 91.

crop added more than \$66 million in value to the state's economy.^{1/} Of this value, returns to growers were in excess of \$27 million, and nongrowers received \$39 million. The nongrower value was made up of production and marketing expenses paid out by pear growers. Analysis of a similar type for the other deciduous fruits would indicate comparable types of contributions to the California economy.

The importance of deciduous fruit production to individual counties is indicated by computations similar to those above which show that in several counties as high as 36 percent of the total personal income of the county is developed from this industry.^{2/}

Production

California production of the major deciduous fruits utilized at least partially in fresh form increased about 40 percent between 1925-1960. Pears and freestone peaches showed the most substantial gains (Figure 1). The state's production of these two fruits also showed the largest gains relative to other parts of the United States (Table 2), and these increases were the principal factors in the rise in the California share of the nation's production of all of the deciduous fruits included in this study from about 39 percent in 1924-1927 to almost 49 percent in 1957-1960.

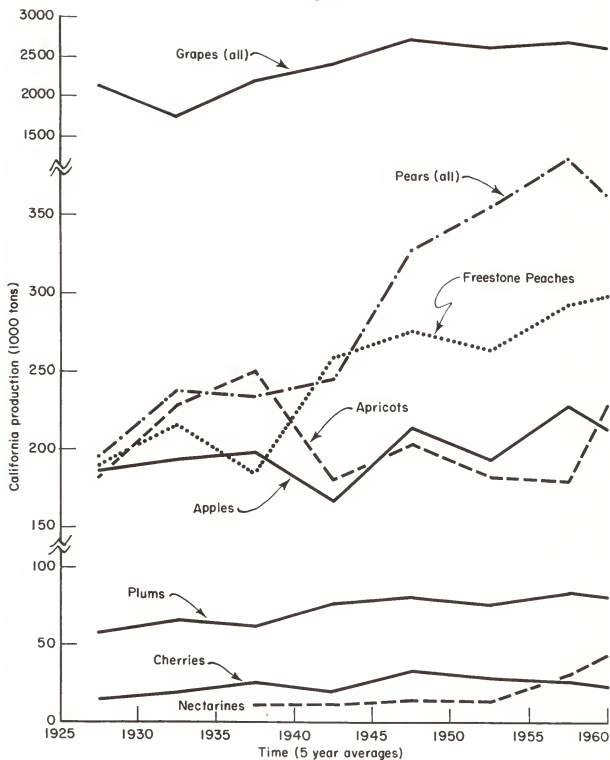
Acreage and Yield

Total California bearing and nonbearing acreage of the fruits included in this study declined from 989,200 acres in 1927 to 675,400 acres in 1959 (Table 3). Acreage declined steadily from 1927 to 1955; however, since 1955, total acreage has been increasing each year. The large increases in nonbearing acreage--from 36,100 acres in 1954 to 52,200 acres in 1955--continued through 1959, with a total increase in nonbearing acreage during this period

^{1/} A. D. Reed, "Ramifications of the Pear Decline Disease in the General Economy of California," California Agriculture, Vol. 15, No. 2, February, 1961, pp. 2-3.

^{2/} Based on the author's calculations for Tulare and Lake Counties in 1959.

Figure 1



California Production of Selected Deciduous Fruits
Five-Year Averages, 1925-1929 to 1955-1959 and 1960

Source: Appendix Table A.1.

TABLE 2

California Production as a Percentage of Total United States Production
Selected Deciduous Fruits, 1924-1927, 1938-1941, and 1957-1960

Fruit	California as percentage of United States		
	1924-1927	1938-1941	1957-1960
Apples	5.5	6.2	8.0
Apricots	99.9	90.8	90.3
Cherries (sweet)	<u>a/</u>	31.1	25.5
Grapes	90.9	92.7	90.8
Nectarines	<u>a/</u>	100.0	100.0
Peaches Freestone	19.5	19.0	26.5
Pears	35.7	34.3	55.3
Plums	91.3	93.5	91.4
Total	39.1	43.2	48.6

a/ No data available.

Source: Appendix Table A.1.

TABLE 3

Total Acreage Composition, Selected Deciduous Fruits, California, 1927 and 1959

Fruit	Total acreage			Percentage of total acreage		
	1927	1959	1959 as a percentage of 1927	1927	1959	Change: 1959 as compared to 1927
Apples	58,100	27,500	47.3	5.9	4.1	-1.8
Apricots	96,300	42,600	44.3	9.7	6.3	-3.4
Cherries	16,200	14,400	88.9	1.6	2.1	+0.5
Grapes	627,800	454,800	72.4	63.5	67.3	+3.8
Nectarines	1,800	11,800	655.5	0.2	1.7	+1.5
Peaches Freestone	67,600	47,100	69.7	6.8	7.0	+0.2
Pears	86,700	47,800	55.1	8.8	7.1	-1.7
Plums	34,700	29,400	84.7	3.5	4.4	+0.9
Total	989,200	675,400	68.3	100.0	100.0	0

Source: Appendix Table A.2

of 60,000 acres.^{1/} Table 3 shows the shift between 1927 and 1959 in the relationship that the acreage of each of these fruits bears to the total.

The average increase in yields per bearing acre for all of these fruits since 1924-1927 was about 194 percent; however, apple, peach, and pear yields increased more than 250 percent during this period (Table 4). Yield increases largely reflect the improvement of cultural practices and development of new varieties, rootstocks, and methods of reducing crop losses from disease and insects. In addition, there have been some shifts to higher yielding production areas, and increased production for processing probably has resulted in greater use of varieties and cultural practices bringing higher yields.

Location of California Acreage

The most dramatic development in the location of deciduous fruit acreage in California has been the large increase in the San Joaquin Valley share of total acreage. In 1940 this area had 63.4 percent of total state acreage of these fruits, and in 1960 it had 72.8 percent (Table 5). During this period all other crop reporting districts in the state experienced declining percentages of total acreage of these deciduous fruits.

Among the individual fruits, the general shift to the San Joaquin Valley is indicated by the high percentages of the state's 1960 nonbearing acreage located in that area. In that year the following percentages of total nonbearing acreage were in the San Joaquin Valley: apricots, 49; cherries, 58; grapes, 97; nectarines, 95; freestone peaches, 85; and plums, 75.^{2/} The most apparent change in location of production is evident in the plum acreage. In 1940 the Sierra foothill areas had 40 percent of the total plum acreage in the state, and the San Joaquin Valley had 34 percent. In 1960 the foothill areas had 24 percent, and the San Joaquin Valley had 62 percent.

Number of Producing Farms

In 1959 there were about 19 percent fewer farms producing the deciduous fruits considered in this study than there were in 1954 (Table 6). The most

^{1/} See Appendix Table A.2.

^{2/} See Appendix Table A.3.

TABLE 4

Yield Per Bearing Acre, Selected Deciduous Fruits
California, 1924-1927 and 1957-1960

Fruit	Average yield per bearing acre		1957-1960 as a percentage of 1924-1927
	1924-1927	1957-1960	
	tons		
Apples	3.4	9.8	288.2
Apricots	2.3	4.8	208.7
Cherries	1.5	2.1	140.0
Grapes	3.8	6.5	171.0
Nectarines	a/	6.2	a/
Peaches Freestone	3.4	8.8	255.8
Pears	3.4	10.4	305.9
Plums	2.1	3.6	171.4
Average ^{b/}	3.5	6.8	194.3

a/ No data available prior to 1936.

b/ Does not include nectarines.

Sources: Appendix Tables A.1 and A.2.

TABLE 5

Total Acreage, by Crop Reporting Districts, Selected Deciduous Fruits, California, 1940 and 1960

Fruit	Year	District number and location ^{a/}								Total
		1	2	3	4	5	5a	6	8	
		North Coast	North Central	North-east	Central Coast	Sacramento Valley	San Joaquin Valley	Sierras and foothills	South-ern	
acres										
Apples	1940	1,533	351	189	29,826	744	728	1,425	2,413	37,209
	1960	1,140	188	45	22,192	619	767	1,687	1,292	27,930
Apricots	1940	4	14	2	38,500	9,362	16,266	43	11,422	75,613
	1960	1	-- ^{b/}	--	24,435	6,657	9,315	14	2,746	43,168
Cherries	1940	36	27	4	6,802	1,881	4,670	564	1,045	15,029
	1960	12	15	--	5,545	599	7,448	219	398	14,236
Grapes (raisin and table)	1940	121	105	--	1,245	8,911	311,158	519	16,617	338,676
	1960	10	--	--	521	580	318,353	110	15,815	335,399
Nectarines	1940	--	--	--	260	262	2,453	22	40	3,038
	1960	--	--	--	147	121	11,557	3	111	11,939
Peaches (free-stone)	1940	129	130	35	2,681	6,125	28,723	1,315	5,734	44,872
	1960	25	109	44	559	5,564	36,505	501	2,094	45,401
Pears	1940	3,833	63	6	23,279	9,474	594	10,688	1,271	49,208
	1960	3,764	20	1	18,891	11,674	1,318	10,420	488	46,576
Plums	1940	105	5	2	1,029	4,065	8,324	9,863	937	24,330
	1960	18	1	4	1,122	2,151	18,231	6,967	911	29,405
Total	1940	5,761	696	238	103,622	40,824	372,916	24,439	39,479	587,975
	1960	4,970	333	94	73,412	27,965	403,494	19,921	23,855	554,044

^{a/} District names are not applied by the California Crop and Livestock Reporting Service. Those shown here are general guides to location only (see Appendix Figure A.1 for location of crop reporting districts).

^{b/} Dashes indicate no acreage reported.

Source: Appendix Table A.3.

TABLE 6

Number of Farms Harvesting Selected Deciduous Fruits^{a/}
California, 1954 and 1959^{b/}

Fruit	Number of farms harvesting		1959 as a percentage of 1954
	1954	1959	
Apples	9,892	7,849	79.3
Apricots	11,975	8,838	73.8
Cherries	5,571	4,231	75.9
Grapes			
Table	7,075	5,799	82.0
Raisin	9,625	8,998	93.5
Peaches			
Freestone	12,740	10,225	80.3
Pears			
Bartlett	7,429	5,886	79.2
Other	2,826	2,386	84.4
Plums	9,597	7,575	78.9
Average change			81.0

a/ Nectarines not reported.

b/ The data on number of farms harvesting these fruits prior to the census of 1954 are not comparable to the 1954 and 1959 data due to a change in the census procedure. In 1954 and 1959, only farms with more than 20 trees or vines were enumerated. Prior to these years all farms with any fruit trees or grapevines were included; hence, the number of farms reporting fruit harvested in 1954 was greatly reduced in comparison to earlier years.

Source: U. S. Bureau of the Census, U. S. Census of Agriculture: 1959, Vol. I, Part 48 (California), 1961, pp. 17-20.

pronounced reductions have been in the number of farms harvesting apricots, cherries, and plums.

Acreage and Production Projections to 1975

According to a recent study, a 10 percent increase in apple yields is expected between 1954-1957 and 1975 due to improvement of cultural practices and orchard management.^{1/} Apple acreage is also expected to increase about 8,000 acres, principally in the present Central Coast production areas; however, in contrast to the long-term trend, much of the new acreage is expected to be shipping varieties.

Grape yields are expected to be about 16 percent above 1954-1957 levels by 1975, largely due to heavy planting of Thompson seedless on highly productive soils in the San Joaquin Valley where most of the acreage increase will be. Among the "other fruits" (apricots, cherries, nectarines, peaches, pears, plums, prunes, figs, and avocados), the most significant yield increases are expected in prunes, nectarines, and plums. The projections relating to deciduous fruits are shown in Table 7.

The authors of this study suggest several other factors that are believed to explain the sharp increase in the concentration of the California deciduous fruit industry in the San Joaquin Valley: (1) urbanization in the Central Coast areas and in southern California, (2) relatively higher yields in the Central Valley in comparison to the coastal areas, (3) concentration of the fruit processing industry in the Modesto-Yuba City-Oakland triangle, and (4) the impetus to produce higher value crops in the southern San Joaquin Valley due to increasing land and water costs.^{2/}

Utilization--Fresh and Processed

A substantial percentage of many of the major deciduous fruits is processed rather than sold in fresh form. As shown in Table 8, an average of

^{1/} Gerald W. Dean and Chester O. McCorkle, Jr., Projections Relating to California Agriculture in 1975, University of California, Giannini Foundation Mimeographed Report No. 234 (Berkeley, 1960), pp. 23-27.

^{2/} Ibid., pp. 26-27.

TABLE 7

Projections of California Yields, Acreage, and Production for Selected Fruits with Alternative Assumptions as to California's Share of United States Production, 1975

California projections	Assuming California's share is the same as 1954-1957			Assuming California's share is changed from 1954-1957 ^{a/}		
	Apples	Grapes	Other fruits ^{b/}	Apples	Grapes	Other fruits ^{b/}
1. 1975 index of yield (1954-1957 = 100)	110	116	110	110	116	110
2. 1975 share of United States production (percent)	3.6	91.3	47.4	4.2	92.9	54.0
3. 1975 index of acreage (1954-1957 = 100)	114	134	125	131	136	143
4. 1975 acreage (1,000 acres)	30.7	589.9	552.5	35.3	598.7	632.1
5. 1975 index of production (1954-1957 = 100)	125	155	138	144	158	157
Changes projected, 1954-1957 to 1975 (percent):						
6. Increased yield	10.0	16.0	10.0	10.0	16.0	10.0
7. Increased share of United States production	c/	c/	c/	.5	1.6	6.6
8. Increased acreage	14.0	34.0	25.0	31.0	36.0	43.0
9. Increased production	25.0	55.0	38.0	44.0	58.0	57.0

a/ Assumes increased share of United States production shown on line 7.

b/ Apricots, cherries, nectarines, peaches, pears, plums, prunes, figs, and avocados.

c/ Does not apply.

Source: Gerald W. Dean and Chester O. McCorkle, Jr., Projections Relating to California Agriculture in 1975, University of California, Giannini Foundation Mimeographed Report No. 234 (Berkeley, 1960), pp. 12 and 16.

TABLE 8

Changes in Tonnage of Selected Deciduous Fruits Utilized, Fresh and Processed
California, 1937-1939 to 1957-1959

Fruit	1937-1939 average tonnage			1957-1959 average tonnage			Change in percentage sold fresh, 1937-1939 to 1957-1959 percent
	Fresh	Proc- essed	Fresh as percent- age of total	Fresh	Proc- essed	Fresh as percent- age of total	
	thousand tons		percent	thousand tons		percent	
Apples	99.9	86.2	53.7	79.0	154.6	33.8	-19.9
Apricots	19.7	238.9	7.6	9.1	144.9	5.9	- 1.7
Cherries	13.5	12.8	51.3	7.5	11.1	40.6	-10.7
Grapes All	514.2	1,886.7	21.4	507.9	2,149.4	19.1	- 2.3
Nectarines	8.7	2.7	76.8	34.0	1.1	96.8	+20.0
Peaches Freestone	68.8	140.5	32.9	113.6	182.2	38.4	+ 5.5
Pears Bartlett	98.1	110.5	47.0	88.8	257.0	25.7	-21.3
Other	33.0	.1	99.5	16.5	21.6	43.4	-56.1
Plums	62.2	1.8	97.2	72.4	3.6	95.2	- 2.0
Total	918.1	2,480.2		928.8	2,925.5		
Average ^{a/}			27.0			24.1	- 2.9

^{a/} Based on tonnage.

Source: Appendix Table A.7.

27.0 percent of the fruits included in this study was sold fresh in 1937-1939 compared to 24.1 percent in 1957-1959. With the exception of nectarines and peaches, the percentage of each of these fruits utilized fresh declined between these two periods.

Returns to Growers, by Type of Utilization

On the average, the returns from canning for the major processing fruits--apricots, peaches, and Bartlett pears--were the following percentages of fresh returns during the years shown in Table 9: 1927-1929, 85.6; 1937-1939, 84.5; and 1957-1959, 78.0. Gross returns per ton to growers from sales to processors rarely equal or surpass returns from the fresh market; however, differences in quality standards, varieties, harvesting procedures, and other cultural practices make it impossible to generalize about net returns from these data.

A fairly stable relationship between gross returns from canning and fresh utilization is indicated in Table 9. Grower returns from drying show a considerably less stable relationship. Raisins, for example, returned only 58.8 percent of the fresh return in 1937-1939, but they brought 87.5 percent of the fresh price in 1957-1959.

Comparison of California Grower Returns with United States Average

California grower returns per ton from apples, grapes, peaches, and pears are generally lower than the average for the United States; however, this is probably due to the relatively greater utilization of these fruits for processing in California than in other states and higher transportation costs due to the distance to many major markets. For those fruits produced almost exclusively in California--apricots and plums--the state's average grower returns are higher than the nationwide average (Table 10).

California average returns per ton for all of these fruits have been increasing relative to the United States average during the past 25 years (Table 10). In 1924-1927 California returns were 83.3 percent of the national average, in 1938-1941 they were 94.5 percent, and in 1957-1960 they were 102.8 percent. This trend is generally reflected in the returns received for each individual type of fruit.

TABLE 9

Gross Returns Per Ton to Growers from Processing as a Percentage of Gross Returns Per Ton to Growers
from Fresh Utilization, Selected Deciduous Fruits
California, 1927-1929, 1937-1939, 1957-1959

Fruit	1927-1929				1937-1939				1957-1959			
	Canned	Dried	Crushed	Brined	Canned	Dried	Crushed	Brined	Canned	Dried	Crushed	Brined
	percentage of fresh returns per ton to grower											
Apples	a/	46.7	28.1	--b/	31.8 ^{c/}	29.9	25.0	--				--
Apricots	101.0	90.3	--	--	81.3	94.3	--	--	82.5	134.3	--	--
Cherries	93.2	--	--	89.7	92.8	--	--	89.4	76.7	--	--	66.3
Grapes				--	96.6	58.8	65.0	--	91.2	87.5	64.5	--
Peaches												
Freestone	78.9	97.3	--	--	90.8	79.1	--	--	66.4	85.1	--	--
Pears												
Bartlett	76.8	54.3	--	--	81.3 ^{a/}	77.1	--	--	85.2	122.5	--	--
Other			--	--	98.7 ^{a/}		--	--	94.9		--	--
Plums	46.7	--	--	--	66.8	--	--	--	24.8	--	--	--

a/ Blanks indicate no data available.

b/ Dashes indicate none reported.

c/ 1939 only; no data available for prior years.

d/ 1937 only; no data available for 1938-39.

Source: Appendix Table A.9.

TABLE 10

Comparison of United States and California Prices Received by Growers
Selected Deciduous Fruits, 1924-1927, 1938-1941, and 1957-1960

Fruit	1924-1927			1938-1941			1957-1960			Average for specified years, California as percentage of United States
	United States	California	California as percent- age of United States	United States	California	California as percent- age of United States	United States	California	California as percent- age of United States	
	dollars per ton	dollars per ton		dollars per ton	dollars per ton		dollars per ton	dollars per ton		
Apples	50.51	32.50	64.3	33.54	20.21	60.3	74.37	55.94	75.3	66.6
Apricots	a/			41.42	42.42	102.4	120.00	120.50	100.4	101.4
Cherries (sweet)				96.60	107.88	111.7	320.25	380.00	118.7	115.2
Grapes	31.10	27.20	87.5	17.92	16.10	89.8	59.42	55.20	92.9	90.1
Peaches ^{b/}	54.06	31.77	58.8	34.31	24.90	72.7	81.04	67.81	83.7	71.7
Pears	58.65	55.10	93.9	32.08	26.61	83.1	81.01	75.10	92.7	90.0
Plums	69.48	73.12	105.4	48.85	49.88	102.1	180.50	188.15	104.3	103.9
Average	52.74	43.94	83.3	43.50	41.15	94.5	130.93	134.69	102.8	93.6

a/ Blanks indicate no data available.

b/ United States data include all peaches; for California, only freestones are included.

Source: Appendix Table A.10.

Seasonality of Harvesting and Fresh Marketing

The seasonal nature of deciduous fruit harvesting and fresh marketing is a major factor influencing the organization and operations of the industry. Figure 2 shows the typical harvesting and marketing periods for these fruits in each district. Marketing periods are extended through the use of cold storage for those fruits which can be satisfactorily stored.

As shown in Figure 2, the peak of the season (active harvest period) is relatively short for most of these fruits. In general, the active harvesting season in the state occurs between June and October. Only the later varieties of grapes and apples extend past that date. The majority of the fruits in most districts are harvested between the first of June and the end of August.

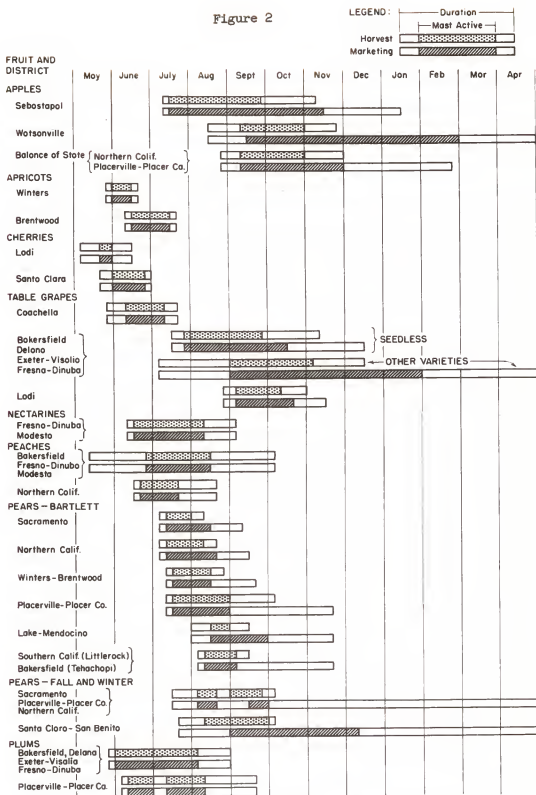
The marketing seasons shown in Figure 2 are general indications of the periods when the fruits are available in the fresh form from the various districts, and they reflect the storage life of these fruits. Table 11 shows the approximate safe storage periods of most of these fruits. In Table 12 the actual shipments of these fresh fruits produced in 1959 and shipped in 1959 and 1960 are shown. For purposes of presentation, the 1959 shipping season is assumed to start on May 1; however, the long-storage varieties of apples, grapes, and pears are still being shipped from storage in April and a few are shipped in May. A few cars of cherries are moved in late April, and these are considered the earliest shipments of the season.

As can be noted in Table 12, almost two-thirds of the shipments of these fruits are made between June 1 and October 1, and more than 80 percent are shipped between June 1 and November 1. Heaviest grape movement occurs during August, September, and October when 61.2 percent of the shipments are made. In general, June, July, and August are the months of the greatest tree fruit shipments with 76.4 percent. July is the heaviest shipping month of all fruits with 19.2 percent of total annual shipments, but August and September are close behind with 18.3 percent and 17.9 percent, respectively.

Trends in Shipping Varieties of Deciduous Fruits

There are a great number of varieties of most of the types of deciduous fruits produced in California; however, as the fresh shipping industry has developed in commercial importance, attention has focused on fewer varieties of each type of fruit.

Figure 2



Typical Harvesting Dates and Fresh Marketing Periods,
Selected California Deciduous Fruits, by District

Source: U. S. Agricultural Marketing Service, Crop Reporting Board,
Fruits and Tree Nuts, Bloom, Harvesting, and Marketing Dates, and
Principal Producing Counties, by States, Agricultural Handbook No.
186, 1960, 125p.

TABLE 11

Estimated Length of Safe Storage Periods, Selected Fresh Deciduous Fruits

Fruit	Approximate length of time of safe storage	
	Months	Weeks
Apples	(Normal) (Maximum)	
Gravenstein	0-1	3
Delicious	3-4	6
Yellow Newtown	5-7	8
Apricots		1-2
Cherries (sweet)		1½-2
Table grapes		
Emperor, Ribier, and Almeria	3-6	
Nectarines		2-4
Peaches		2-4
Pears		
Bartlett	1½-3	
Hardy	2-3	
Comice	2-3	
Bosc	3-3½	
Anjou	5-6	
Winter Nelis	6-7	
Plums		3-4

Source: R. C. Wright, Dean H. Rose, and T. M. Whiteman, The Commercial Storage of Fruits, Vegetables and Florist and Nursery Stocks, U. S. Department of Agriculture, Agricultural Handbook No. 66, 1954, pp. 15, 18, 19, 22, 23, and 26-30.

TABLE 12

California Fresh Deciduous Fruit Shipments, 1959-60 Shipping Season, by Months

	1959								1960				Season total	Each category as a percentage of total
	May ^a	June	July	August	September	October	November	December	January	February	March	April		
	carlots													
<u>Apples</u>														
Interstate passings	b/												57	2.4
Rail			11	13	11	15	7						480	20.5
Truck	27	30	58	81	103	36	30	29	28	19	21	18		
Intrastate unloads														
Truck	21	41	133	273	351	276	121	134	178	130	100	46	1,804	77.1
Total	48	71	202	367	465	327	158	163	206	149	121	64	2,341	100.0
Percentage of seasonal total	2.0	3.0	8.6	15.7	19.9	14.0	6.7	7.0	8.8	6.4	5.2	2.7		
<u>Apricots</u>														
Interstate passings													201	33.1
Rail	64	121	16										78	12.8
Truck	15	54	9											
Intrastate unloads														
Truck	56	198	74	1									329	54.1
Total	135	373	99	1									608	100.0
Percentage of seasonal total	22.2	61.3	16.3	.2									100.0	
<u>Cherries^{c/}</u>														
Interstate passings													328	64.4
Rail	208	120											53	10.4
Truck	32	20	1											
Intrastate unloads														
Truck	70	58											128	25.2
Total	310	198	1										509	100.0
Percentage of seasonal total	60.5	38.7	.2										100.0 ^{c/}	
<u>Grapes (all varieties)</u>														
Interstate passings													24,196	68.3
Rail	171	773	2,156	2,787	5,824	6,803	2,075	1,669	723	572	439	204	7,541	21.3
Truck	65	470	945	1,393	1,728	1,049	546	491	267	240	220	127		
Intrastate unloads														
Truck	26	218	624	787	779	541	310	165	78	61	96	54	3,699	10.4
Total	262	1,461	3,725	4,967	8,331	8,393	2,931	2,325	1,068	873	715	385	35,436	100.0
Percentage of seasonal total	.7	4.1	10.5	14.0	23.5	23.7	8.3	6.6	3.0	2.5	2.0	1.1	100.0	
<u>Nectarines</u>														
Interstate passings													1,273	47.6
Rail		205	659	392	17								638	23.9
Truck		101	238	268	31									
Intrastate unloads														
Truck		160	354	218	29	1							762	28.5
Total		466	1,251	878	77	1 ^{d/}							2,673	100.0
Percentage of seasonal total		17.4	46.8	32.9	2.9	0.3							100.0	

(Continued on next page.)

TABLE 12--continued.

	1959								1960				Season total	Each category as a percentage of total
	May ^{b/}	June	July	August	September	October	November	December	January	February	March	April		
	carlots													
<u>Peaches (freestone)</u>														
Interstate passings	b/													
Rail	68	379	962	354	105	6	1						1,875	23.8
Truck	84	756	907	497	150	29							2,423	30.8
Intrastate unloads														
Truck	113	1,174	1,052	919	276	39							3,573	45.4
Total	265	2,309	2,921	1,770	531	74	1						7,871	100.0
Percentage of seasonal total	3.4	29.3	37.1	22.5	6.7	1.0	0.3						100.0	
<u>Pears (all varieties)</u>														
Interstate passings														
Rail	6	8	1,158	1,569	961	383	183	51	13	5	12	16	4,365	70.3
Truck	11	10	173	258	135	79	22	9	11	10	14	11	743	11.9
Intrastate unloads														
Truck	2	3	120	342	336	151	49	26	23	13	20	17	1,104	17.8
Total	19	21	1,451	2,169	1,432	613	254	88	47	28	46	44	6,212	100.0
Percentage of seasonal total	.3	.3	23.4	34.9	23.1	9.9	4.1	1.4	.8	.4	.7	.7	100.0	
<u>Plums (and prunes)</u>														
Interstate passings														
Rail	235	1,413	1,429	642	82	2							3,803	64.8
Truck	45	386	428	214	34	4							1,111	18.9
Intrastate unloads														
Truck	8	318	316	243	65	3							953	16.3
Total	288	2,117	2,173	1,099	181	9							5,867	100.0
Percentage of seasonal total	4.9	36.1	37.0	18.7	3.1	.2							100.0	
<u>All listed fruits</u>														
Interstate passings														
Rail	752	3,019	6,391	5,757	7,000	7,209	2,266	1,720	736	577	451	220	36,099	58.7
Truck	279	1,827	2,759	2,711	2,181	1,197	598	529	306	269	255	156	13,068	21.2
Intrastate unloads														
Truck	296	2,170	2,673	2,783	1,836	1,011	480	327	279	204	176	117	12,353	20.1
Total	1,327	7,016	11,823	11,251	11,017	9,417	3,344	2,576	1,321	1,050	882	493	61,520	100.0
Percentage of seasonal total	2.2	11.4	19.2	18.3	17.9	15.3	5.5	4.2	2.1	1.7	1.4	.8	100.0	
<u>Tree fruits</u>														
Total	1,065	5,555	8,098	6,284	2,686	1,024	413	251	253	177	167	108	26,084	42.4
Percentage of seasonal total	4.1	21.3	31.0	24.1	10.3	3.9	1.6	1.0	1.0	.7	.6	.4	100.0	

^{a/} Some late storage fruits from the previous season are often shipped in May; however, the number of carlots shipped can be assumed approximately equal each year, so the pattern of monthly shipments suggested by this table is little affected.

^{b/} Blanks indicate no shipments reported.

^{c/} Three carlots of cherries were shipped in April, and these were the first shipments of the 1959-60 season.

^{d/} Less than .05 percent.

Sources: U. S. Agricultural Marketing Service, Fresh Fruit and Vegetable Shipments, Calendar Year 1959, p. 9; and Fresh Fruit . . . Calendar Year 1960, pp. 11-12.

Table 13 shows that out-of-state shipments have been increasingly dominated by a few varieties within each type of fruit. In general, the leading varieties in 1935-1937 have increased their margin during this 25-year period. Gravensteins, for example, moved from 82.7 percent to 100 percent of total reported out-of-state shipments of apples; Emperor and Thompson seedless grapes, from 55.5 to 76.7 percent of grape shipments; and Bartletts, from 83.7 to 90.8 percent of pear shipments.

Many varieties have decreased in importance in fresh shipping. Tokays were 24.1 percent of interstate grape shipments in 1935-1937 and only 11.4 percent in 1958-1960. Malaga grapes made up 10.9 percent of interstate shipments of this fruit 25 years ago, but they have accounted for only .2 percent of these shipments in recent years.

In addition to these varieties for which interstate passings data are available, the California Tree Fruit Agreement has compiled information on plum varieties which aids in pointing up the shifting varietal preferences for this fruit. Table 14 utilizes these data to show the dramatic changes which have taken place in the varieties of plums shipped. Whereas average interstate shipments of Santa Rosas in 1958-1960 were 256.4 percent of the 1935-1937 average, the ratios for Giants, Burbanks, Wicksons, and Tragedys were only 14.2, 24.4, 25.2, and 27.7 percent, respectively.

Per Capita Consumption of Deciduous Fruits

United States per capita consumption of the fruits considered in this study declined from 112.8 pounds per year in 1924-1927 to 85.0 pounds in 1956-1958 (Table 15). Consumption in the fresh form dropped from 83.3 pounds per capita to 40.4 pounds between these two periods. The trend to consumption in the processed form is indicated by the reduction in the share of fresh to total per capita consumption from 72.3 percent in 1924-1947 to 47.6 percent in 1956-1958.^{1/}

^{1/} Use of per capita consumption data requires certain precautions. First, they are simply estimates. Second, the two principal determinants of per capita consumption are annual supply--for these fresh fruits, this is largely current production--and the number of people eating out of the civilian food supply, which approximates the civilian population. Thus, it is apparent that a decrease in production of any fruit in any year and a constant population will result in a reduced per capita consumption figure. Constant production and an increasing population will have the same effect. Also, changing ratios of processing and handling loss will affect these data.

TABLE 13

California Out-of-State Shipments, Selected Fresh Deciduous Fruits, by Varieties, 1935-1937 and 1958-1960

Fruit	Average shipments		Percentage of total		
			1935-1937	1958-1960	Change: 1958-1960 as compared to 1935-1937
	1935-1937	1958-1960			
	carlots				
Apples					
Bellflower	14	0	1.5	0	- 1.5
Gravenstein	772	49	82.7	100.0	+17.3
Newtown	85	0	9.1	0	- 9.1
Other	62	0	6.7	0	- 6.7
Total	933	49	100.0	100.0	0
Table grapes					
Almeria	92	383	.6	2.5	+ 1.9
Cardinal	0	376	0	2.4	+ 2.4
Cornichon	166	0	1.0	0	- 1.0
Emperor	4,113	5,615	24.8	36.4	+11.6
Malaga	1,814	26	10.9	.2	-10.7
Muscat	29	27	.2	.2	0
Perlette	0	298	0	1.9	+ 1.9
Red Malaga	733	246	4.4	1.6	- 2.8
Ribier	347	470	2.1	3.1	+ 1.0
Thompson	5,089	6,212	30.7	40.3	+ 9.6
Tokay	4,005	1,759	24.1	11.4	-12.7
Others	198	3	1.2	0	- 1.2
Total	16,586	15,415	100.0	100.0	0
Pears					
Bartlett	3,937	3,234	83.7	90.8	+ 7.1
Anjou	12	15	.3	.4	+ .1
Buerre Bosc	113	194	2.5	5.4	+ 2.9
Buerre Hardy	171	0	3.6	0	- 3.6
Comice	42	73	.9	2.1	+ 1.2
Easter Buerre	1	0	0	0	0
Winter Nelis	16	22	.3	.6	+ .3
Others	409	25	8.7	.7	- 8.0
Total	4,701	3,563	100.0	100.0	0

Source: Appendix Table A.4.

TABLE 14

Interstate Shipments of Fresh Plums by Variety
California, 1935-1937 and 1958-1960

Variety	Interstate shipments		1958-1960 as a percentage of 1935-1937
	1935-1937 average	1958-1960 average	
	carlots		
Ace	0	87	
Beauty	437	538	123.1
Burbank	180	44	24.4
Duarte	229	452	197.4
Late Duarte	0	153	
Diamond	82	7	8.5
El Dorado	0	297	
Giant	120	17	14.2
Kelsey	168	88	52.4
President	256	266	103.9
Santa Rosa	592	1,518	256.4
Late Santa Rosa	0	214	
Tragedy	195	54	27.7
Late Tragedy	0	84	
Wickson	282	71	25.2
Total	3,456	3,391	

Source: Appendix Table A.5.

TABLE 15

Average Per Capita Consumption, Fresh and Total, Selected Deciduous Fruits
United States, 1924-1927, 1946-1948, and 1956-1958

Fruit	Average per capita consumption						Fresh as a percentage of total per capita consumption		
	Fresh			Total			1924-1927	1956-1958	Change: 1956-1958 as compared to 1924-1927
	1924-1927	1946-1948	1956-1958	1924-1927	1946-1948	1956-1958			
	pounds								
Apples	49.3	24.5	20.3	52.0	29.0	27.3	94.8	74.4	-20.4
Apricots	.2	.6	.2	1.8	3.1	1.7	11.1	11.8	+ .7
Cherries	1.8	.9	.5	a/	2.8	2.4		20.8	
Grapes	8.9	6.0	4.3	32.2	38.2	31.2	27.6	13.8	-13.8
Nectarines		.2	.3		.2	.3		100.0	
Peaches Freestone	14.1	13.9	9.3	16.5	16.4	12.2	85.5	76.2	- 9.3
Pears	6.3	5.6	3.9	7.5	10.0	8.2	84.0	47.6	-36.4
Plums and prunes ^{b/}	2.7	2.3	1.6	2.8	2.5	1.7	96.4	94.1	- 2.3
Total	83.3	54.0	40.4	112.8	102.2	85.0	72.3	47.6	-24.7

a/ Blanks indicate no data available.

b/ Prunes other than dried.

Source: Appendix Table A.6.

MARKETING INSTITUTIONS: STRUCTURE, ORGANIZATION, AND PRACTICES

The two major types of marketing institutions for fresh deciduous fruits are first handlers and California sales agencies as defined in the preceding section. Firms in each of these segments vary in their organization, functions, and business practices. In this section, the following characteristics of these firms are discussed: (1) general organization and functions, (2) physical facilities and handling methods used, (3) procurement sources and methods, and (4) sales organization and procedures.

To supplement the statistical data available from published sources, information on industry characteristics was obtained from mail and interview surveys. A list of first handlers was compiled from various trade sources and was composed of 402 local packing and/or shipping facilities believed to be engaged in one of the following types of operation: local grower-shipper; local cooperative association; local branch of a regional or statewide cooperative; local commercial packer and shipper; local branch of a regional, statewide, or nationwide commercial packer and shipper; or local handling facility of a multilocal grower-shipper. Thus, each listing was intended to be a single plant or other facility handling fresh deciduous fruits.

District locations were defined (Figure 3) to conform with the boundaries of major shipping areas generally recognized by the shipping and buying trade. Of the total number of facilities listed, 31 were interviewed and the balance were contacted by mail. Mail survey returns were received from approximately 65 percent of the firms found to be actively engaged in fresh deciduous fruit marketing.^{1/}

^{1/} For purposes of simplifying the presentation, the terms "firm" and "plant" are used interchangeably in most of this discussion. The great majority of first handlers operate a single plant, and the local facilities of multiple-plant firms are considered independent of the parent company in regard to most of the aspects of operations of importance to this study. In those instances where recognition of multiple-plant operations is important to the analysis, such a differentiation is made.

Figure 3



Fresh Deciduous Fruit Shipping Districts, California, 1960

The addition of the interviewed firms brought the number of handlers represented to about 71 percent of the net industry list.^{1/}

Management personnel of 10 major California sales agencies were interviewed. These agencies were known to include the largest volume firms and represented the various types operating in the state--cooperative and commercial. Industry sources indicated that data from this sample would be representative of these marketing institutions.

First Handlers

First handlers have been defined as firms operating packing and/or shipping facilities in the deciduous fruit-producing areas.^{2/} Fruit is generally delivered to a first-handling facility for sorting, grading, and packing; or, if it has been packed in the field or on the producing farms, it is delivered for cooling, loading, shipping, and/or storage. Table grapes are often field packed in the vineyard; and some cherries, plums, and peaches are packed on the farm prior to delivery to the first handler. These practices vary according to district, varieties, and individual growers.

A substantial percentage of fruit from some districts and some growers moves directly from the farm to nearby wholesale receivers, particularly in Los Angeles and San Francisco. These receivers are not considered first handlers in the context of this study.

Data from the 238 first-handling facilities represented in the study were classified in five different ways:

1/ Information from industry sources and governmental agencies indicated that the firms responding were generally representative of the entire segment of the industry sampled. The major types of firms (grower-shippers, cooperatives, and commercial packers and shippers) were widely represented. Comparison with data published by the California Crop and Livestock Reporting Service, California Fruit and Nut Crops (Sacramento, May 1, 1961), pp. 3-5, indicated that firms responding to the survey handled about 65 percent of the total quantity of these fruits moving to the fresh market in the year studied. The distribution of individual types of fruit handled by the surveyed firms closely approximated the distribution of these fruits in relation to the total tonnage reported by the California Crop and Livestock Reporting Service.

2/ Shippers are differentiated from packers since some shippers do not pack but only receive field-packed fruit. The term "packer and shipper" refers to firms performing both of these operations.

1. Data for all firms in this segment were summarized.
2. Data for firms of the three major types were summarized. These types of firms were defined as follows:
 - a. Grower-shippers--firms that grow on their own land some portion of the fruit handled.^{1/}
 - b. Cooperative associations--organizations that handle fruit produced by cooperative members or a limited number of non-members.
 - c. Commercial packers and shippers--firms that handle fruit produced by others on a commercial basis for an established set of charges.
3. Data from first handlers were summarized according to the district in which they operate (district boundaries shown in Figure 3).
4. Data were classified according to the type of fruit handled by the various firms. For example, information for all firms handling apples is summarized. Grapes are classified into two categories--table and juice. Juice grapes are those varieties shipped to the fresh market.
5. The handling facilities were ordered according to the magnitude of their 1959 tonnage, from largest to smallest; and the data for various groups of firms, such as the largest four firms or the largest 10 percent of the firms, were summarized.

General Organization and Functions

Types of Firms.--Of the 238 local facilities responding to the survey, 66.0 percent were operated by grower-shippers. These handled 65.5 percent of the total tonnage of these fruits included in the study (see Table 16). Cooperatives operated 15.1 percent of the facilities and handled 16.5 percent of the tonnage. Commercial packers and shippers operated 18.9 percent of the facilities and handled 18.0 percent of the tonnage.

^{1/} It is recognized that some grower-shippers also operate as commercial handlers for other growers. The extent of this practice is considered in a later section. However, to simplify the discussion, the grower-shipper category was defined to include firms producing any part of the fruit handled. The following table shows the percentage of fruit handled by these firms that they produce themselves:

<u>Percentage of fruit handled grown by firm</u>	<u>Percentage of total number of grower-shippers</u>
100	51.6
75-99	15.2
50-74	10.2
25-49	11.5
Less than 25	11.5
	<u>100.0</u>

TABLE 16

Distribution of Total Tonnage and Tonnage of Each Type of Fruit
Among the Different Types of First-Handling Firms, California, 1959

Type of firm	Tonnage of fruit handled as a percentage of total of all firms ^{a/}	Percentage of total tonnage								
		Apples	Apricots	Cherries	Table grapes	Juice grapes	Nectarines	Peaches	Pears	Plums
Grover-shippers	65.5	80.7	67.1	32.1	79.4	68.4	69.9	71.1	18.1	48.6
Cooperatives	16.5	19.3	31.5	7.5	6.1	0	13.0	7.4	63.7	24.0
Commercial packers	18.0	0	1.4	60.4	14.5	31.6	17.1	21.5	18.2	27.4
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

^{a/} Total tonnage of fruit handled by firms responding to mail and interview surveys.

Source: Mail and interview surveys.

There is considerable difference in the types of firms operating in each district. For example, 100 percent of the firms responding in the Delano and Watsonville districts were grower-shippers, while only 16.7 percent of the respondents in the Placerville district were of this type (see Table 17 for data on other classifications).

Legal Form of Organization.--Of the handlers represented, 23.5 percent are single proprietorships, 33.2 percent are partnerships, 15.1 percent are cooperatives, and 28.2 percent are noncooperative corporations. Form of organization varies among the types of firms other than cooperatives. Among the grower-shippers, 31.8 percent were single proprietorships, 42.7 percent were partnerships, and 25.5 percent were corporations. Of the commercial packers and shippers, only 13.3 percent were single proprietorships, while 26.7 percent were partnerships and 60.0 percent were corporations (see Table 17 for data on other classifications).

Number of Years in Business.--The average number of years in business for all first handlers responding to the survey was 26. The grower-shippers had been in business an average of 25 years; cooperatives, 36 years; and commercial packers, 21 years (see Table 17 for data on other classifications).

Control by Other Firms.--Approximately 14 percent of the first-handling facilities responding to the survey were controlled by other firms, either as a branch or as a wholly owned subsidiary. Among the grower-shippers, 5.7 percent were so controlled (including local operations of multi-unit firms). Forty percent of the commercial packers and 16.7 percent of the local cooperative operations were controlled by other firms (see Table 17 for data on other classifications).

Functions Performed.--Of the first handlers responding to the survey, 97 percent operate packinghouses or pack in the field. The balance of the firms handle only cooling and loading of field-packed fruit. Sixty-six percent of the firms responding grow deciduous fruits, and 13 percent grow commodities other than deciduous fruits. Only about 5 percent of the first handlers responding pack other commodities. Approximately 50 percent of the handlers operate cold storage or precooling rooms.

About 5 percent of the first handlers operate some type of drier for fruits or nuts. Other functions performed include the operation of grower supply stores, receiving fruit for processors, managing farms for growers, and

TABLE 17
Characteristics and Functions of First-Handling Firms, by District, Type of Fruit Handled, and Cumulative Size Group, California, 1960

Classification	Total number of firms	Type of firm			Legal form of organization				Average years in business	Con- trolled by other firms	Functions performed				
		Grower- shipper	Coopera- tive	Commer- cial packer	Single proprie- torship	Partners- ship	Coopera- tive	Corpo- ration			Pack decidu- ous fruits	Grow other crops	Pack other crops	Operate cold storage or pre- cooler	
District		percentage of total			number of firms					number of firms	number of firms				
1. Coachella	11	90.9	9.1	a/	5	1	1	4	24	1	11	2	1	4	
3. Bakersfield	11	72.9	9.1	18.2	3	1	1	6	15	2	11	4	1	7	
4. Delano	18	100.0			4	9	0	5	22	1	18	3	3	13	
5. Exeter-Visalia	32	62.5	15.6	21.9	5	16	5	6	30	3	32	7	0	20	
6. Fresno-Dinuba	64	79.7	3.1	17.2	20	26	2	16	18	3	63	6	0	33	
7. Modesto	11	63.6	27.3	9.1	3	4	3	1	31	0	11	2	1	6	
8. Lodi	25	36.0	16.0	48.0	3	9	4	9	28	6	19	1	1	10	
9. Sacramento River	7	57.1	14.3	28.6	2	0	1	2	42	3	7	0	0	0	
10. Placerville-Placer County	12	8.3	50.0	41.7	0	6	6	6	33	7	12	1	0	9	
11. Winters-Brentwood	6	66.7	33.3		2	1	2	1	26	0	6	1	1	1	
12. Sebastopol	6	66.7	33.3		2	1	2	1	31	0	6	0	0	0	
13. Lake-Mendocino	9	22.2	66.7	11.1	0	3	6	0	28	1	9	1	0	7	
14. Northern California	7	71.4	28.6		3	1	0	3	31	2	7	1	1	2	
15. Santa Clara-San Benito	12	58.3	25.0	16.7	1	2	3	6	33	3	12	1	1	1	
16. Watsonville	7	100.0			2	3	0	2	33	0	7	0	0	5	
Type of fruit handled															
Apples	16	81.2	18.8		4	5	3	4	33	0	16	0	0	7	
Apricots	7	57.1	14.3	28.6	3	0	1	3	19	3	7	1	2	5	
Table grapes	21	42.8	19.1	38.1	3	3	4	11	29	6	18	2	2	1	
Juice grapes	140	74.3	10.0	15.7	30	53	14	43	23	12	136	21	7	82	
Nectarines	49	73.5	26.5	13	53	0	15	19	3	47	5	4	22	2	
Peaches	76	71.0	16.1	12.9	18	24	10	24	24	10	74	12	5	43	
Pears	82	74.4	13.4	12.2	22	26	11	23	24	9	81	15	4	49	
Plums	43	39.5	39.5	21.0	3	9	17	15	34	15	43	5	3	19	
	87	62.1	17.2	20.7	18	20	15	33	25	18	86	12	4	54	
Cumulative size group ^{b/}															
Largest 4	4	75.0	25.0		0	1	1	2	33	1	4	2	1	4	
Largest 8	8	62.5	12.5	25.0	0	2	1	5	26	2	8	3	2	8	
Largest 20	20	75.0	15.0	10.0	0	4	3	13	27	2	20	6	4	19	
Largest 10 percent	24	75.0	16.7	8.3	0	5	4	15	26	3	24	6	4	22	
Largest 50	50	68.0	18.0	14.0	3	12	9	26	25	10	50	9	7	41	
Largest 25 percent	60	65.0	15.0	20.0	5	16	9	30	26	13	60	10	7	45	
Largest 50 percent	119	61.3	16.8	21.9	16	35	20	36	26	23	118	14	8	74	
Largest 75 percent	178	64.6	17.4	18.0	33	57	31	56	25	32	173	24	11	100	
100 percent	238	66.0	15.1	18.9	56	79	36	67	26	34	231	30	11	118	

a/ Blanks indicate that no firms of this type responded.

b/ Firms ranked according to the magnitude of total tonnage of these fresh deciduous fruits handled in 1959.

Source: Mail and interview surveys.

performing various production activities for growers such as spraying, pruning, thinning, and harvesting.^{1/}

Of the grower-shippers, about 48 percent operate cold storage or precooling plants. Forty-seven percent of the commercial packers and shippers and 61 percent of the cooperatives operate such plants (see Table 17 for data on other classifications).

Physical Facilities Operated

Field Packing and House Packing.--Although California deciduous fruits are largely packed in packinghouses, a number of fruits--principally table grapes--are packed in the vineyard (field packed); but these pass through cooling and loading facilities in the production area. The relative extent of field and house packing in the different districts is shown in Table 18, which is based on data from firms interviewed in the course of this study. Of the total tonnage of table grapes handled by these firms, 41.1 percent was field packed. About 4.1 percent of the tree fruits were packed on the producing farms prior to delivery to first handlers.^{2/}

Capital Requirements and Ownership of Facilities.--First-handling firms may own or lease their facilities. Among the handlers interviewed, about 20 percent leased their packinghouses and about 6 percent owned their facilities, but these were built on land leased from a railroad. Most of the handlers own the cold storage plants adjacent to their packing facilities; however, a few lease these from separate corporations whose ownership is often almost identical with that of the packinghouse.

Initial investment in facilities, of course, varies among those owning and leasing their facilities; however, the major variations found were due to type, capacity, utilization, and age of the facilities. Operating capital requirements also vary greatly due to the amount of grower financing and other services provided as well as size of operation.

^{1/} See Appendix B for additional data on functions performed by first handlers.

^{2/} This type of packing is usually performed by family members or other relatively small groups on the farm, and it does not include the field packing of grapes or the operation of packing facilities usually associated with a commercial size packinghouse. Among the tree fruits, plums, cherries, and some varieties of peaches are sometimes packed on the farm. Of the total tonnage of plums handled by firms interviewed, 30.4 percent was packed in this manner. In Placer County, the principal area where this is done, 66.8 percent of the plums were packed on the producing farm. No data are available for the tonnage of cherries or peaches so packed.

TABLE 18

Percentage of Fresh Deciduous Fruits House Packed and Field Packed
by Districts, California, 1960

District	Percentage of total district tonnage	
	House packed	Field packed
1. Coachella	10.8	89.2
3. Bakersfield	54.5	45.5
4. Delano	38.3	61.7
5. Exeter-Visalia	96.5	3.5
6. Fresno-Dimuba	97.4	2.6
7. Modesto	100.0	0
8. Lodi	23.3	76.7
9. Sacramento River	100.0	0
10. Placerville-Placer County	87.0	13.0
11. Winters-Brentwood	100.0	0
12. Sebastopol	100.0	0
13. Lake-Mendocino	100.0	0
15. Santa Clara-San Benito	100.0	0
16. Watsonville	100.0	0
Total	78.2	21.8

Source: Firms interviewed.

Among the handlers interviewed, original investment of firms with a packinghouse and cold storage plant ranged from \$100,000 to \$1,250,000, averaging about \$514,000. Investments in packinghouses with only precooling facilities ranged from \$64,000 to \$150,000, averaging about \$113,000. Original investments in plants having no cooling facilities ranged from \$40,000 to \$88,000, averaging about \$60,000.^{1/}

Original investment capital utilized by the interviewed firms was largely obtained from bank loans supplemented with their own funds, including subscriptions from cooperative members. All of the firms use their own funds and returns from fruit sales for part of their operating capital, and for 10 percent of the firms this is the sole source of such capital. Fifty-nine percent of the firms rely largely on bank credit, and 31 percent use advances from their sales agencies or parent firms.

Packinghouses.--The packinghouses operated by the first handlers interviewed averaged 18 years in age, ranging from 1 to 40 years. Most of the plants more than 20 years old have been remodeled to some degree in the past 10 years, principally through the installation of new equipment and reinforcing floors to support forklift trucks. Table 19 shows the percentage of interviewed first handlers using the types of equipment indicated for various packinghouse operations.

Cold Storage and Precooling Facilities.--For the purposes of this study, cold storage plants were defined as those with a capacity of more than 20 carlots of the principal fruit handled. Cold storage facilities with capacities of 20 carlots or less are classified as precoolers.^{2/} Using this definition of the first handlers responding to the surveys, 32.4 percent operate cold storage plants, and an additional 18.1 percent operate precooling facilities. The storage plants have an average capacity of 120 carlots, and the precoolers average 11 carlots.

Among the different types of firms, there is considerable variation in relation to cold storage and precooler operation. Among the grower-shippers,

^{1/} Differences in the handling equipment and facilities requirements among the various types of fruit in addition to age and capacity of plants are factors leading to the observed variation in original investment data.

^{2/} A precooler is a small cooling facility used principally to reduce fruit temperature and hold fruit prior to loading. Precooling rooms are also used in conjunction with cold storage plants to lower fruit temperature prior to moving into storage. This latter type of precooler is included with cold storage plants in this study.

TABLE 19

Percentage of Interviewed First-Handling Firms
Utilizing Various Types of Equipment for
Principal Packinghouse Operations

Operation and type of equipment	Percentage of firms using each type of equipment
Receiving	
Forklifts	83.9
Hand trucks	16.1
Dumping ^{a/}	
Automatic	52.2
Hand	47.8
Packing ^{a/}	
Belt	64.0
Tubs	16.0
Bins	20.0
Lidding	
Semiautomatic	100.0
Loading	
Forklift	35.5
Hand truck	29.0
Conveyor	12.9
Forklift and conveyor	19.4
Forklift and hand truck	3.2

^{a/} Tree fruit only.

Source: Firms interviewed.

31.8 percent operate cold storage plants averaging 128-carlot capacity, and another 18.5 percent have precoolers. Fifty percent of the cooperatives have cold storage plants averaging 131-carlot capacity, and an additional 19.4 percent of these organizations operate precoolers. Among the commercial packers and shippers, 22.2 percent have cold storage facilities averaging 59-carlot capacity, and another 22.2 percent have precoolers (see Table 20 for data on other classifications).

Use of New Handling Techniques

Three relatively recent innovations in the handling of fresh deciduous fruits are (1) prepackaging in consumer-size units, (2) bulk filling of containers, and (3) handling in bulk bins.^{1/} The practice of prepackaging at shipping point increased considerably during the early 1950's and has been a factor in the handling of these fruits since that time. Bulk filling has also been utilized to an increasing degree since shortly after World War II. Use of bulk bins for hauling these fruits from the orchard to the plant is of more recent origin, having been initiated largely during the late 1950's. An even more recent development is the utilization of these bins for shipment of certain fruits to fresh sales outlets or prepackaging operations.

Prepackaging in Consumer-Size Units.--Of the first handlers responding to this survey, 8.4 percent prepackaged consumer-size units in their plants during the 1959 season. Of the total tonnage of all handlers, about .9 percent was prepackaged in that year. About 7.8 percent of the apples handled were prepackaged, 1.2 percent of the table grapes, and .1 percent of the plums.

Almost 80 percent of the first handlers engaged in prepackaging were grower-shippers. Table 21 shows those districts in which some prepackaging was done in 1959 and indicates the number of firms engaged in this operation and the fruits prepacked. Table 22 indicates the number of firms in the various cumulative size groups that prepackaged these deciduous fruits in 1959. Although prepackaging is not confined to the very largest firms, it can be noted in the table that 37 percent of those performing this operation were among the largest 10 percent of the firms.

^{1/} The term "bulk bins" used in this study refers to bins having a capacity of about 1,000 pounds of fruit that are handled with forklift trucks. These are sometimes referred to as "pallet bins."

TABLE 20

Average Capacities and Percentage of First-Handling Firms Operating Cold Storage and Precooling Facilities by District, Type of Fruit Handled, and Cumulative Size Group, California, 1960^a

Classification	First-handling firms operating:				
	Cold storage plants ^{a/}		Precooling plants		Cold storage or precooling plants
	As percentage of total number of firms	Average capacity carlots	As percentage of total number of firms	Average capacity carlots	As percentage of total number of firms
<u>District</u>					
1. Coachella	--b/	--	36.4	10	36.4
3. Bakersfield	18.2	250	54.5	11	72.7
4. Delano	--	135	--	--	72.2
5. Exeter-Visalia	56.2	149	3.1	18	59.3
6. Fresno-Dinuba	34.4	80	20.3	12	54.7
7. Modesto	--	--	54.5	7	54.5
8. Lodi	32.0	72	12.0	12	44.0
9. Sacramento River	--	--	--	--	--
10. Placerville-Placer County	25.0	243	66.7	9	91.7
11. Winters-Brentwood	--	--	16.7	12	16.7
12. Sebastopol	--	--	--	--	--
13. Lake-Mendocino	77.8	119	--	--	77.8
14. Northern California	14.3	135	14.3	20	26.6
15. Santa Clara-San Benito	--	--	--	--	--
16. Watsonville	42.8	85	--	--	42.8
<u>Type of fruit handled</u>					
Apples	31.2	173	--	--	31.2
Apricots	--	--	14.3	12	14.3
Cherries	19.0	76	4.8	10	23.8
Table grapes	43.6	118	17.1	12	60.7
Juice grapes	38.8	98	12.2	6	51.0
Nectarines	39.5	104	23.7	13	63.2
Peaches	32.9	95	30.5	10	63.4
Pears	30.2	141	23.3	9	53.5
Plums	37.9	114	32.2	12	70.1
<u>Cumulative size group^{c/}</u>					
Largest 4	100.0	297	--	--	100.0
Largest 8	100.0	205	--	--	100.0
Largest 20	95.0	209	--	--	95.0
Largest 10 percent	91.7	197	--	--	91.7
Largest 50	72.0	164	12.0	12	84.0
Largest 25 percent	61.7	162	15.0	13	76.7
Largest 50 percent	51.3	137	13.4	11	64.7
Largest 75 percent	41.6	124	17.4	11	59.0
100 percent	32.4	120	18.1	11	50.5

a/ A number of cold storage plants are operated by first handlers as separate companies with slightly different ownership from the first-handling firms. These are not included in these data.

b/ Dashes indicate none reported.

c/ Firms ranked according to the magnitude of total tonnage of fresh deciduous fruits handled in 1959.

Source: Mail and interview surveys.

TABLE 21

Number of First-Handling Firms Prepackaging and Types of Fruit Prepackaged
by District, California, 1959^{a/}

District	Number of firms prepackaging		
	Table grapes	Table grapes and plums	Apples
3. Bakersfield	2		
4. Delano	2		
5. Exeter-Visalia	3		
6. Fresno-Dinuba	3	2	
8. Lodi	1		
10. Placerville-Placer County			1
12. Sebastopol			1
16. Watsonville			4

^{a/} Includes only those districts in which at least one responding firm was engaged in prepackaging.

Source: Mail and interview surveys.

TABLE 22

Number of First-Handling Firms Prepackaging
by Cumulative Size Group, California, 1959

Cumulative size group ^{a/}	Number of firms prepackaging
Largest 4	2
Largest 8	3
Largest 20	6
Largest 10 percent	7
Largest 50	9
Largest 25 percent	9
Largest 50 percent	14
Largest 75 percent	17
100 percent	19

^{a/} Firms ranked according to the magnitude of total tonnage of fresh deciduous fruits handled in 1959.

Source: Mail and interview surveys.

First handlers and sales agencies interviewed agreed that prepackaging of these fruits in California reached its peak during 1955 or 1956 and has probably declined since then. Most of the sales agencies handled a small amount of prepackaged fruit for their accounts in 1960; however, none of them handled as large a volume of these as they had in previous years.

Although there seems to be continuing buyer interest in prepackaged fruit, especially grapes, handlers are generally reluctant to increase their prepackaging operations.^{1/} The most common cause for this reluctance among handlers interviewed was their inability to obtain firm buyer commitments for prepackaged fruit at prices which they felt would cover the added cost of the packing labor and materials. Many of the firms that had initiated prepackaging operations in the mid-1950's experienced a high initial demand for these packs, particularly among the large retail chains, but this demand quickly subsided. Reorders were fewer than expected, and few buyers would commit themselves either to take a specific quantity of prepackaged fruit over the season or to pay what the packer felt was a reasonable differential. As a result, most of these first handlers have since eliminated or greatly restricted prepackaging operations.

Most sales agencies, although generally not encouraging prepackaging at shipping point, felt that with sufficient buyer demand backed by contracts or volume guarantees they could develop sources of supply of these packs from first handlers. However, during the 1960 season, this type of demand had not been in evidence.

Bulk Filling of Containers.--Among the first handlers interviewed, about 25 percent used bulk-filling methods for part of their 1960 pack. Plums, apples, and pears were packed in this manner.

Tree fruit handlers all indicated interest in the cost-saving features of bulk-filling containers, but, with the exception of apple handlers, almost all felt that buyer acceptance of these packs is so limited that their general use is not now feasible. Many plum-packing firms had tried the plum container developed by the industry for bulk filling, and almost all of these firms had

^{1/} Buyer interest is illustrated in a recent survey among retail food store executives and reported in Robert L. Bull and Robert L. Carey, "Executives Survey the Future for Produce Packaging and Marketing," Produce Marketing, Vol. 4, No. 9, September, 1961, pp. 47-49.

abandoned it. As with prepackaged fruits, reorders for this container were very few after an initial flurry, and cost savings were largely offset by reduced market prices.

Apple packers interviewed had shifted almost entirely to fiber containers, bulk filled or tray packed. Little resistance from buyers has been felt; however, most of these packers sell a large proportion of their apples on firm orders in California markets.

Among the principal objections to bulk filling voiced by first-handler and sales agency personnel are the following:

1. Highest quality or largest fruit does not get its deserved premium when bulk packed.
2. There is general resistance to changes of this type not only among buyers but among some sales organizations representing first handlers.
3. The cost of a fiber container which is adequate for reasonably long storage is too high in relation to wooden containers.
4. Savings realized in packing such containers largely go to the buyer but are seldom reflected in lower retail prices.

These opinions are not based on analysis of the problems but rather the general industry feeling. However, they are reflected in industry decisions. Some of these problems are analyzed in later sections of this study.

Handling in Bulk Bins.--About 14.8 percent of the first handlers responding to the survey used bulk bins in some part of their operations in 1960. Approximately 50 percent of these handlers used bins for orchard-to-plant hauling, and almost 75 percent used bins for shipment to processors.

Table 23 shows how the utilization of bulk bins varies among the districts, with the widest use indicated in the pear and apple districts. The table also shows the use of these containers by firms in the various cumulative size categories. It is apparent that use of bulk bins is not restricted to the largest firms. As shown in the table, of the largest 25 percent of the handlers, eight utilize bins; while among the smallest 25 percent, six use them.

Interviewed first handlers of grapes and the softer tree fruits felt that the types of bulk bins available in 1960 were not suited to the handling of their products for fresh use. However, one large grape packer believed that a large container for a one-layer, stem-up pack might be feasible for shipping grapes to prepackaging firms.

TABLE 23

Number of First-Handling Firms Using Bulk Bins, and Type of Use
by District and Cumulative Size Group, California, 1960

Classification	Using bulk bins	Type of use	
		Orchard to plant hauling	Shipment to processors ^{a/}
	number of firms		
<u>District^{b/}</u>			
3. Bakersfield	2	2	-- ^{c/}
4. Delano	3	3	--
6. Fresno-Dinuba	4	1	3
7. Modesto	1	1	1
8. Lodi	1	--	1
9. Sacramento River	2	2	1
10. Placerville-Placer County	7	4	6
12. Sebastopol	5	2	5
13. Lake-Mendocino	5	1	5
14. Northern California	1	1	1
15. Santa Clara-San Benito	1	1	1
16. Watsonville	2	1	2
<u>Cumulative size group^{d/}</u>			
Largest 4	2	2	1
Largest 8	3	2	2
Largest 20	5	2	4
Largest 10 percent	5	2	4
Largest 50	7	4	5
Largest 25 percent	8	4	6
Largest 50 percent	23	12	19
Largest 75 percent	28	15	19
100 percent	34	18	25

a/ Grape packers using bulk tanks for shipment to wineries are not included.

b/ Only those districts are shown in which responding first handlers indicated use of bulk bins.

c/ Dashes indicate none reported.

d/ Firms ranked according to the magnitude of total tonnage of fresh deciduous fruits handled in 1959.

Source: Mail and interview surveys.

Among pear and apple packers--the largest current users of these bins--most felt that these containers cause no more bruising in orchard-to-plant transportation, and probably less, than their regular picking boxes. Two of these firms use bulk bins for all such hauling. An apple packer indicated that these bins allow better cooling and save on storage space. Problems of shifting to bins from picking boxes include liquidation of existing inventories of boxes, the necessity of small growers investing in bin-handling equipment, and the need to move bins frequently in the orchard when the crop is light or when fruit is picked for color or size.

Use of Truck Shipment

During the 1950's one of the striking changes in fresh fruit marketing was the increasing use of truck transportation as opposed to rail shipment. The following data, obtained from interviewed first handlers, indicate the magnitude of this shift:

<u>Method of shipment</u>	<u>Percentage of tonnage shipped</u>	
	<u>1950</u>	<u>1959</u>
Rail	86.9	62.8
Truck	13.1	37.2

The extent of truck utilization varies according to the type of fruit. U. S. Department of Agriculture data shown in Table 24 give the percentages of the fresh tonnage of each of these fruits that moved by truck during the 1959-60 season. The difference between the 41.2 percent "all fruit listed" figure in the table and the 37.2 percent obtained from interviewed firms is believed to be due to the fact that individual growers' shipments to local markets, which move entirely by truck, are not represented in the first-handler data.

The increase in truck shipment illustrates the interrelationship between technical changes and industry organization and practices. Equipment and highways have improved greatly during the past 15 years. Corresponding to this development, terminal markets, such as auctions, have become relatively less important as decentralization of marketing activities increases. In the California industry, first handlers have built facilities to accommodate truck shipments and have adjusted their organizations to better facilitate this type of transportation.

TABLE 24

Percentage of Total Fresh Tonnage Shipped by Truck
Selected Deciduous Fruits
California, 1959-60 Season

Fruit	Percentage of fresh tonnage shipped by truck 1959-60 season
Apples	97.6
Apricots	66.9
Cherries	35.7
Grapes	31.7
Nectarines	52.4
Peaches	76.2
Pears	29.7
Plums	35.2
Total	41.2

Sources:

U. S. Agricultural Marketing Service, Fresh Fruit and Vegetable Shipments, Calendar Year 1959, p. 9.

Idem, Fresh Fruit and Vegetable Shipments, Calendar Year 1960, pp. 11 and 12.

Mixed Truckload Shipments.--There has been an increasing demand for truckloads made up of a variety of fruits and vegetables. During the 1950's two general methods were employed to meet this demand:

1. Mixed loads were assembled at a central market, principally Los Angeles, for out-of-state shipment.
2. Trucks were routed through the production areas and various commodities were loaded where they were packed.

In addition to these procedures, a third practice developed between 1958 and 1960. Various varieties and packs of produce were consolidated at centralized locations within the production districts. Facilities for this consolidation were established either by sales agencies that accumulated products from their first-handler accounts or by individual first handlers who purchased from each other and consolidated various lots at their own plants.

Two of the five largest volume sales agencies were operating consolidation points in 1960; however, all of the agencies interviewed felt that handling consolidated shipments would be of increasing importance in the industry due to the expanding buyer demand for such a service. The more recent consolidation procedures were in their infancy in 1960, and little operating experience had been obtained by either buyers or sellers.

Procurement Sources and Methods

Of the total tonnage of fruits packed and shipped by the first handlers included in this study, 44.7 percent was grown by the handlers themselves, 8.0 percent was purchased from growers, and 30.8 percent was packed on a consignment basis for growers other than cooperative members. The remaining 16.5 percent was packed by cooperative associations for their members. Firms purchasing fruit bought from an average of 10 growers. Fruit was handled on consignment from an average of 31 growers per handler, and cooperative membership averaged 41 growers.

Procurement practices vary among the different types of firms. Grower-shippers produced 67.5 percent of the total tonnage they handled. Of the balance of their tonnage, 9.3 percent was purchased, and 23.2 percent was consigned to them by other growers. Cooperatives obtained 99.6 percent of their tonnage from grower-members, and the other .4 percent was consigned by non-members. Commercial packers obtained 88.4 percent of their fruit on a consignment basis and purchased the other 11.6 percent (see Table 25 for data on other classifications).

TABLE 25

Procurement Sources and Methods of First-Handling Firms by District, Type of Fruit Handled and Cumulative Size Group, California, 1960

Classification	Percentage of total tonnage obtained from:			
	Own growing operations	Other growers		
		Purchased	On consignment basis	On cooperative basis
	percent			
<u>District</u>				
1. Coachella	47.0	.9	48.8	3.3
3. Bakersfield	88.9	2.6	5.5	3.0
4. Delano	85.7	2.5	11.8	<u>a/</u>
5. Exeter-Visalia	56.1	1.0	28.0	14.8
6. Fresno-Dimuba	35.4	16.9	42.5	5.1
7. Modesto	40.3	18.9	18.1	22.7
8. Lodi	9.3	15.4	61.5	13.8
9. Sacramento River	44.0	<u>b/</u>	35.7	20.3
10. Placerville-Placer County	.7		31.8	67.5
11. Winters-Brentwood	50.5		9.5	40.0
12. Sebastopol	18.5	2.1	27.8	51.5
13. Lake-Mendocino	7.3		7.2	85.5
14. Northern California	47.4	1.4	51.2	--
15. Santa Clara-San Benito	26.1	5.8	22.0	46.2
16. Watsonville	88.4	8.2	3.4	--
<u>Type of fruit handled</u>				
Apples	42.5	3.2	10.6	43.7
Apricots	20.9	20.6	45.2	13.3
Cherries	6.1	9.2	70.8	13.9
Table grapes	51.3	9.4	32.8	6.5
Juice grapes	43.2	13.0	43.5	.3
Nectarines	32.2	9.5	42.2	16.0
Peaches	31.3	8.9	40.9	19.0
Pears	14.6	3.1	29.2	53.1
Plums	35.7	8.3	39.7	16.3
<u>Cumulative size group^{c/}</u>				
Largest 4	58.3	5.7	13.3	22.7
Largest 8	49.4	5.4	31.8	13.4
Largest 20	50.1	6.5	29.4	14.0
Largest 10 percent	50.9	6.0	27.9	15.2
Largest 50	45.7	7.0	30.5	16.8
Largest 25 percent	43.7	7.0	34.0	15.3
Largest 50 percent	43.1	7.7	32.2	17.0
Largest 75 percent	43.4	8.2	31.7	16.7
100 percent	44.7	8.0	30.8	16.5

a/ Dashes indicate none reported.

b/ Blanks indicate less than .1 percent.

c/ Firms ranked according to the magnitude of total tonnage of these fresh deciduous fruits handled in 1959.

Source: Mail and interview surveys.

Procurement Arrangements.--Among the 31 first handlers interviewed, about 55 percent had some type of written contract with at least a part of their growers; however, over half of these firms were cooperatives using some type of contract or agreement with their members. Thus, other than cooperatives, only about 22 percent of the total number of firms interviewed used a formal contract with their growers.

Cooperative contracts generally specify that all deciduous fruits produced by the member are to be delivered to the association unless specific exemptions are made by the board of directors. These contracts are on a continuing basis, although members may withdraw during a specific month, usually considerably in advance of harvest.

The formal contracts used by other types of handlers are usually tied to some type of financing. Production financing and some other types of advances are usually accompanied by a crop mortgage and a marketing contract.^{1/} Among interviewed handlers other than cooperatives, fruit obtained on the basis of a formal contract ranged from 20 to 100 percent of the firms' total tonnage. These contracts are usually of one-year duration and are renewed annually.

By far the greatest percentage of fruit handled by firms other than cooperatives is obtained on the basis of a continuing, informal, oral agreement between the first handler and the grower. In these situations, the first handler and grower are usually in contact throughout the year, and, even if advances or supplies are furnished by the handler, more formal arrangements are seldom made.

When fruit is purchased on the tree or vine by the first-handling firm, the transaction is usually formalized by a purchase agreement including a description of the acreage involved, variety of fruit, estimated tonnage, and price.

Sales Organization and Procedures

About one-half of the first handlers interviewed sold more than 75 percent of their fruit through a sales agency, and the balance of the firms sold more than 75 percent of their fruit themselves. The internal sales organization of these firms reflects this major difference in selling procedures.

^{1/} See Appendix B.

Among those firms handling their own sales, one of the owners is generally in charge of sales, although some of the large companies have a sales manager. Utilization of selling brokers varies widely. Of those firms using brokers, only a few give them exclusive sales territories. Generally, firms selling the majority of their fruit themselves use brokers in some markets, while sales in other markets and to direct buyers are made by the manager or sales manager.

The great majority of first handlers that sell any of their fruit through sales agencies use these agencies almost exclusively; however, some of these handlers sell intrastate through wholesale houses in Los Angeles and/or San Francisco. Contact between first handlers and the major central sales agencies is often maintained through field personnel of the sales agency. In some cases, managers of first-handling facilities are consulted by the agency in regard to almost every sale made. Others are consulted only if changes in prices or other terms are to be made, and others leave the selling in the hands of the agency almost entirely.

Since about 1955 there has been an increase in the volume of sales made at the local handling facilities. This has been principally due to the expansion in the proportion of tonnage sold to buyers with either their own procurement organization or other representation in the California shipping districts. Another recent change has been the increase in sales made to buying brokers and cash buyers operating in the production areas. This shift has also had the effect of increasing the volume of sales transactions carried on in the shipping districts as opposed to those handled in central sales offices.

Sales Arrangements.--Interviewed first handlers sell an average of 90 percent of their fruit to buyers they consider regular customers. Sales are made on a day-to-day basis, and more than 90 percent of sales are on "f.o.b. shipping point" terms. Most of the balance is sold on consignment through commission houses in Los Angeles and San Francisco, although a few sales are made on a "delivered" or "price arrival" basis. Price-arrival sales are generally tied to the price received for a similar car selling in an auction near the destination market on the day of arrival.

None of the first handlers interviewed had continuing contracts or agreements of more than a few weeks' duration with any buyer. However, about 30 percent of the firms sold part of their fresh fruit tonnage on the basis of some type of agreement with the buyer covering a number of cars (or other

units) to be shipped over a specified time period. These agreements are often oral only, but some are covered by a "confirmation of sale." This type of sale is generally termed a "block sale," and it is used principally for certain types of fruit such as peaches and juice grapes as packed or pears and apples from storage. Although sales on this basis accounted for only 1-5 percent of the total tonnage of fruit handled by interviewed firms, such a procedure was used for as high as 50-100 percent of specific types of fruit.

California Sales Agencies

California sales agencies have been defined as selling organizations located within the state whose major function is the sale of fresh fruits for first handlers. Of the 10 agencies contacted in this study, 7 operate on a statewide basis, and 3 largely confine their activities to a particular region. The following discussion is based on interviews with management personnel of these agencies.

Organization and Functions

Eight of the 10 agencies contacted were noncooperative corporations, 1 was a partnership, and 1 a cooperative. Two of them were wholly owned subsidiaries of other companies. All five of the firms handling the largest tonnage of deciduous fruits in California had been in business more than 25 years by 1960. The average of all 10 firms was 42 years, ranging from 17 to 84 years.

The 5 largest volume firms represent a total of 170 first-handling operations, of which 33 are their own branches. Four of these organizations grow deciduous fruits on owned acreage. Nine of these firms maintain a field staff in at least one production area and furnish production credit to growers. Permanent employees involved in the marketing operations of these agencies range from 20 to 75. The five largest firms have an average of 50 employees.

Forty-eight packinghouses are owned or leased and operated by 9 of these 10 agencies. Two companies each operated nine packing facilities in 1960; two firms operated five each; two operated two each; and the others operated eight, seven, and one, respectively. Three of these organizations, including the two handling the largest tonnage, sell all of the principal types of deciduous fruit produced in the state. All of the firms sell grapes and plums.

All of these agencies handle one or more commodities other than deciduous fruits. Among the five largest firms, two handle significant amounts of lettuce and melons, and two sell only strawberries in addition to deciduous tree fruits and grapes. The total number of cars of fruits and vegetables sold by these 10 firms in 1959 ranged from 1,000 to 12,000 cars per firm. However, shipments of deciduous fruits ranged from about 550 to 6,500 cars. The two firms selling the largest number of total cars were not among the five largest volume sellers of deciduous fruits.

Procurement Sources and Methods

Sources of fruit sold by agencies fall into the following three categories:

1. Owned--includes fruit grown on land owned and operated by the firm itself.
2. Purchased--includes packed fruit purchased for resale by the agency.
3. Agency basis--includes fruit sold on an agency basis for independent first handlers and fruit packed on consignment in plants operated by the sales organizations.^{1/}

In 1959, 14.8 percent of the fruit sold by sales agencies interviewed was from owned acreage. Fruit purchased for resale amounted to about 3.5 percent, and the remaining 81.7 percent was handled on an agency basis. These sources have changed very little since 1950, although fruit purchased declined about 1 percent while fruit handled on an agency basis and fruit grown by the agencies increased slightly.

These agencies generally have a marketing contract with the first handlers for whom they sell. The contract usually defines the type and amount of fruit that the agency is to sell, and it indicates the restrictions placed on the first handler as to the sale of fruit other than through the agency. Contracts generally have a duration of one year but are renewed unless notice is given by either party. Unless some type of credit or production financing is involved, marketing contract provisions are rarely strictly enforced by sales agencies. Management personnel of these agencies indicate that fear of loss of goodwill among other accounts and potential accounts is a major reason for such a policy.

^{1/} Fruit sold by the cooperative sales organization is included in the "agency basis" category.

Sales Organization and Procedures

Sales agencies generally maintain a single sales headquarters within the state. These offices consist of a sales manager and from two to five salesmen handling different market areas or different types of buyers. One of these firms operates a sales office at a market center outside of California, and five of these agencies maintain field offices in production areas, usually during the packing season only.

All of these firms utilize selling brokers in market centers to some degree. The five firms with the largest deciduous fruit volume have attempted to maintain their brokerage connections where possible in spite of the increasing share of sales made directly to large-scale buyers. Sales managers of the California agencies indicate that brokers in most areas provide a valuable link between the agency and regional chains, large independents, and the traditional wholesale and jobbing trade. All of the agencies interviewed, except one with its own office in one auction market, utilize broker-receivers in auction markets as has long been the case. However, as volumes of fruit moving through auctions have declined, these brokers generally have shifted their functions toward those of the typical selling broker in other markets.

As large-scale buyers have increased their activities in producing areas through their own buyers or buying brokers in the past decade, the California sales agencies have decentralized their operations within the state by shifting some of the sales functions to the production areas. This has usually been accomplished by increasing field office staffing and giving these offices greater amounts of sales authority. However, in most of these firms, sales are still subject to confirmation from the central sales office.

Terms of sale used by these agencies generally correspond to those discussed earlier in connection with first handlers. Each of these agencies has a core of regular customers to whom it sells from 80 to 100 percent of its volume. The larger firms estimate this group to range from about 70 to 200 buyers.

About 90-100 percent of sales made by these agencies are on a day-to-day basis. Less than 2 percent of sales involve more than one to three carloads. By far the greatest number of sale transactions consist of agreements reached by telephone or teletype. Some sales managers indicate that a trend to more contract or block sales involving a stated number of cars at a specific price may be developing. This seems to be desired by some large-scale retailers in

order to advertise special promotions of these fruits over a longer period than is now possible with unknown prices.

Marketing Orders Applicable to California Fresh Deciduous Fruits

Marketing agreement and order programs allow agricultural producers or producer-handlers jointly to establish certain regulations and administrative procedures relating to the quantity and quality of products sold and certain other practices. Such actions are obviously "collusive" in nature, and without the authority provided by federal and state legislation some of them would risk violation of the existing antitrust laws. The nature of existing programs in the California fresh deciduous fruit industry and some of their ramifications are discussed in this section.

Legislation and Current Programs

Authority for federal marketing agreement and order programs was established by the Agricultural Marketing Act of 1937 (as amended).^{1/} The California Marketing Act of 1937 (as amended) provides the authority for all of the current state marketing orders affecting fresh deciduous fruits.^{2/}

As defined in both federal and California enabling legislation, a marketing agreement is a program entered into by the United States Secretary of Agriculture with handlers of a specific agricultural commodity or by the California Director of Agriculture with the producers and/or handlers of a particular commodity. Only those handlers or producers who enter into the agreement are bound by its provisions. A marketing order, on the other hand, after approval by a certain stated percentage of producers and/or handlers or those handling a certain share of the total tonnage affected, is binding on all members of the industry concerned. All of the federal and state programs in effect in 1962 covering California fresh deciduous fruits were of the marketing order type.

1/ U. S. Department of Agriculture, Price Programs, Agriculture Information Bulletin No. 135, 1957, p. 36.

2/ Sidney Hoos, California Agricultural Marketing Programs--Handbook of Commodity Program Specifications, University of California, Giannini Foundation Mimeographed Report No. 200 (Berkeley, 1957), p. 5.

Marketing programs available under federal legislation differ somewhat from those possible under the California Act. By way of similarity, both Acts provide for surplus control, quality regulation, control of unfair practices, and research. The California Act specifically authorizes advertising and trade promotion programs; and the federal legislation, although not as specific in this respect, also provides for market development projects to aid the marketing, distribution, and consumption of specified commodities.

Two principal differences between federal and state legislation center on volume control and the applicability of the order. First, the federal Act allows volume control programs to continue in effect only as long as producer returns do not exceed parity levels, while the California Act has a more flexible standard, permitting programs deemed necessary to better coordinate supplies with demand and hence maintain enough producers in business to meet normal consumer requirements, and to eliminate waste and promote orderly marketing. Thus, establishing and maintaining a state order is subject to considerably less specific criteria. Second, under federal legislation, regulations are placed only on handlers on approval of at least two-thirds of the growers voting in the referendum. Under the California Act there may be handler programs, producer programs, or joint producer-handler programs.

Federal marketing orders were in effect for the following California fresh deciduous fruits in 1962: Tokay grapes, nectarines, Elberta peaches, Bartlett pears, winter varieties of pears, and plums. State orders covered the following fruits in 1962: early apples, all fresh peaches, Bartlett pears (intrastate shipments and promotion), fall and winter varieties of pears, and plums (intrastate shipments). These orders include differing authorized provisions which can be utilized at the discretion of the administrative bodies with governmental approval.^{1/}

^{1/} Two recent publications describe the various provisions of these marketing orders in addition to others affecting California crops:

Jerry Foytik, Agricultural Marketing Orders: Characteristics and Use In California, 1933-1962, University of California, Giannini Foundation Research Report No. 259 (Berkeley, 1962), 135p.

Kenneth R. Farrell and William W. Wood, Jr., Federal Marketing Orders and Agreements for California Fruits, Vegetables, and Tree Nuts (Berkeley: California Agricultural Extension Service, 1963), 47p.

Administration and Management of Marketing Orders

With the exception of the federal and state marketing orders for fall and winter pears, the elected advisory boards and control committees administering these fresh fruit orders consist entirely of growers or of a majority of growers. Growers and handlers are equally represented on the Fall and Winter Pear Advisory Board and the Winter Pear Control Committee. Handlers are elected to the governing bodies of the state marketing orders for early apples, fresh peaches, Bartlett pears, and fresh plums. The federal orders for Tokay grapes and nectarines provide for shipper advisory committees, but these act in an advisory capacity only. The federal order for fresh Bartletts, plums, and Elberta peaches includes a minority of shippers on the overall control board; however, the commodity committees responsible for recommending regulations are composed of growers only.^{1/}

Although the governing body of each of the marketing order programs is the advisory board, administrative committee, or control committee, the day-to-day work of the program is carried out by a manager who is hired by the elected group. For purposes of coordination, efficiency, and economy, a single manager and staff often handle several related orders. For example, the California Tree Fruit Agreement, with headquarters in Sacramento, manages the following orders:

1. The federal order regulating the handling of fresh Bartlett pears, plums, and Elberta peaches.
2. The federal order for nectarines.
3. The state order for Bartlett pears.
4. The state order for Bartlett pear promotion.

For federal orders operating in California, governmental supervision is provided by the Fruit and Vegetable Division of the U. S. Agricultural Marketing Service. The state orders are under the jurisdiction of the Bureau of Markets of the California Department of Agriculture. A representative of either of these agencies attends all meetings of the governing boards or committees of the marketing orders they supervise.

^{1/} Eligibility for these committees is as follows: an individual grower who produced during the previous season at least 51 percent of the fruit shipped by him during such season or an individual person who represents an organization which produced during the previous season at least 51 percent of the fruit shipped by it during such season.

Operation of Marketing Orders

In general, two types of rules are established under which marketing orders are operated. When the order is approved and goes into effect, procedural regulations are developed which govern its overall organization, administration, and the scope of its regulatory powers. Seasonal regulations are established each year prior to the harvesting seasons upon the recommendation of the governing boards or committees and after approval by the appropriate governmental agency.

Seasonal regulations are published and circulated to all members of the industry before the season starts for each variety. As all of the grade regulations are based on U. S. grades, all fruit marketed under these orders is required to be inspected by authorized inspectors. Violations of these regulations as discovered by the inspectors are reported to the appropriate governmental enforcing agency. Inspection certificates also show the number of packages in each lot and therefore provide a convenient basis for assessments.

Grade, Size, and Maturity Regulations.--The principal method used to control volume of total fresh shipments of the fruits covered by marketing orders has been through the establishment of minimum grade, size, and, in some cases, maturity standards each season. For example, under the federal order for Bartlett pears the following changes have taken place since 1948: (1) Smaller sizes have been eliminated with size 165 becoming the usual minimum permitted since 1957 (a U. S. Combination Grade with 80 percent U. S. No. 1 pears by count in any container was the usual standard in the later 1950's as compared to 70 percent U. S. No. 1 pears permitted in earlier years); (2) shape requirements have remained the same; and (3) allowance for less-than-serious damage by hail has varied with each season's conditions, although the allowed percentage has dropped from 25 to 10 generally.

The most noticeable shift during the early 1950's was the addition of minimum maturity requirements. A general requirement was initiated in 1952. This was made more specific in 1953, with alternatives for various districts. Since 1953 the same standards have prevailed. This maturity regulation for Bartlett pears illustrates the way minimum standards are developed and applied under marketing orders. First, a rather general, tentative regulation is put into effect. Experience gained from one year's operation provides a basis for the next year's revisions of the regulations, and eventually a standard which

is acceptable to most segments of the industry is found and often endures for a number of years.

Use of Shipping Quotas.--Specific volume quotas covering both intrastate and interstate shipments have been used in recent years only for early apples produced in California, principally Gravensteins from the Sebastopol area. Under this order each handler is assigned a daily quota (number of standard apple boxes or equivalent) which can be accumulated for one or more shipments during each week under certain conditions. A quota may be set for intrastate shipments and another may be set for interstate shipments. As most Gravensteins are sold in California markets, the intrastate quota is actually the only one which has been an effective limitation in recent years. Quotas are established during the season by the Early Apple Advisory Board, and they are allocated to members on the basis of their shipments during the previous three years.^{1/}

Within recent years, the federal marketing order for Tokay grapes is the only other California fresh deciduous fruit order under which direct shipment controls have been instituted. With the exception of 1951, Tokay shipping limitations were imposed each year from 1948 through 1955.^{2/} Shipments were limited during the peak periods of these seasons as shown in Table 26. Packing and loading holidays were declared at various times during the season whenever needed to keep shipments within the established limitations. Until 1953 only rail shipments were subject to these limitations, and intrastate shipments were not covered. From 1953 to 1955 allotments were on the basis of number of lugs per three-day period that could be shipped to any market outside the defined producing areas of San Joaquin and Sacramento Counties. Since 1955 no shipment limitations have been imposed under this order.

^{1/} California Department of Agriculture, Administrative Rules and Regulations for the Administration of the Marketing Order for Early Apples Produced in California, As Amended, Effective July 15, 1960 (Sacramento, 1960), 11p.

^{2/} Data concerning the marketing order for Tokay grapes in this section is taken from Tokay Marketing Agreement, Tokay Bulletin (Lodi, California, seasonal issues, 1958 through 1960).

TABLE 26

Shipping Limitations Imposed Under the Federal Marketing Order
for Tokay Grapes, 1948-1955

Year	Period of limitation	Daily carlot shipments permitted ^{a/}
1948	Entire season	135
1949	Until September 21	80
	September 21 to end	100
1950	September 4 to October 15	90
1951	No limitation	
1952	Entire season	120
1953	September 10 to October 14	125 ^{b/}
1954	August 30 to October 4	125 ^{b/}
1955	September 19 to October 16	125 ^{b/}

^{a/} A carlot is defined as the equivalent of 1,105 grape lugs.

^{b/} Actually 375 cars per three-day period were permitted.

Source: Tokay Marketing Agreement, Tokay Bulletin (Lodi, California, seasonal issues, 1948 through 1955).

Major Marketing Channels

The marketing channels for California fresh deciduous fruits consist of first handlers and California sales agencies, firms operating on the wholesale level, and retailers (see Figure 4). The previous sections have discussed the characteristics and role of the handlers and sales agencies in California. In this section the flow of these fruits beyond these segments is considered.

Distribution patterns involve the allocation of products over time, in space, and in different forms. In this study the fresh form of the products is emphasized, although processing alternatives are considered tangentially. The time variable is sharply defined by the nature of the product itself and the length of storage possible (see Table 11).

The marketing seasons for the various types and varieties of fruit deciduous fruits generally start with a relatively few daily shipments which gradually increase in number until the peak of the season. After the peak period, shipments decline until harvesting of nonstorage fruits is completed or until storage stocks are depleted. The bulk of the tonnage of these California fruits is shipped in about 75 days (see Table 12 and Figure 2). This period varies among the individual fruits from about 225 days for apples to only 30 days for cherries. Excluding apples, grapes, and winter pears, the marketing season for the major tonnage of the remainder of these fruits averages about 53 days. Within a single district the shipping season may last only two or three weeks, as in the case of the apricot and early pear districts; or it may extend for eight or nine months, as in the long-storage grape districts.^{1/}

As shown in Table 12, 76.4 percent of the total state volume of deciduous tree fruits is typically shipped during June, July, and August, and 61.2 percent of the fresh grape tonnage is shipped during August, September, and October. About 80 percent of the total volume of these fresh fruits is shipped between June 1 and November 30.

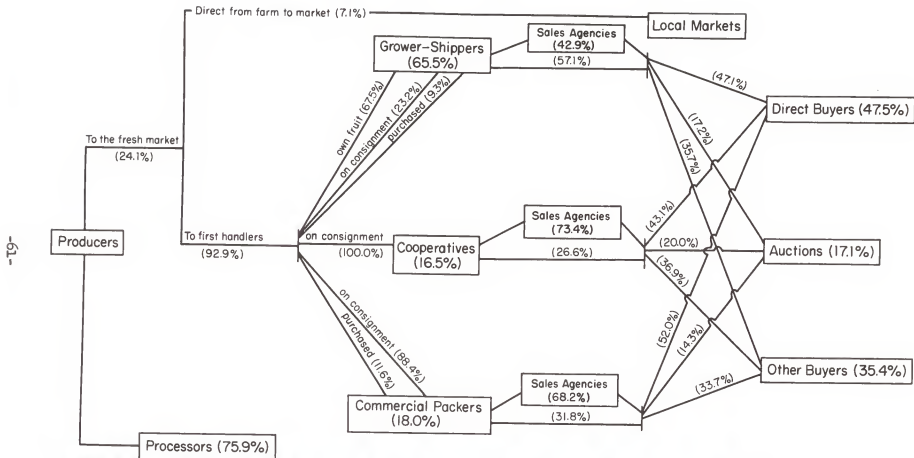
Location of Markets

In 1959 surveyed first handlers sold 76.5 percent of their fresh deciduous fruit tonnage in domestic markets outside of California and in Canada,

^{1/} The marketing seasons for many of these types of fruit are not always continuous due to time lapses between harvesting periods for different varieties.

Figure 4

Marketing Channels, California Deciduous Fruits ^{1/}, 1959



^{1/} Includes apples, apricots, cherries, grapes, nectarines, peaches, pears, and plums.
Percent figures indicate shares of tonnage at each level or of each type of firm.

Source: Mail and interview surveys.

17.4 percent was sold in California, and 6.1 percent was exported to offshore markets.^{1/} Table 27 presents data compiled by the California Crop and Livestock Reporting Service showing the estimated percentage of out-of-state sales of these fruits in the periods 1937-1939 and 1957-1959. As can be seen in the table, the average of these percentages during the latter period agrees quite closely with the share moving to domestic markets out of California indicated by the first handlers responding to the survey. The table also points up the wide differences in the shares of each type of fruit moving in interstate trade.

Grower-shippers and cooperatives sell about 75 percent of their tonnage in domestic markets outside California; however, commercial packers sell 85.4 percent of their fruit in these markets. Cooperatives export 7.1 percent of their tonnage compared to 6.3 percent for grower-shippers and 4.4 percent for commercial packers. The remainder of the sales of these firms are made in California markets, with cooperatives and grower-shippers selling about 19 percent in the state and commercial packers 10.2 percent.

Sales volume in the various market categories differs among the districts, but this is largely related to the types and varieties of fruit produced in the districts. As can be seen in Table 28, for example, 92.6 percent of the tonnage in the Watsonville district (principally apples) is sold in California markets, whereas almost 90 percent of the early grapes from the Coachella district are sold outside the state (see Table 28 for data on other classifications).

Of the tonnage of these fruits sold in domestic markets outside California, a high proportion is shipped to a relatively few large cities from which further distribution takes place. As shown in Table 29, about 53 percent of the interstate rail shipments of the fruits shown is sold in the nine cities for which data are available. However, about 81.2 percent of the cherries, 72.5 percent of the plums, and 60.4 percent of the pears shipped by rail go to these cities.

The California Crop and Livestock Reporting Service estimates that about two-thirds of these fresh deciduous fruits sold within the state are destined for Los Angeles or San Francisco. Table 30 indicates that about 73 percent of

^{1/} Sales agencies interviewed sold about 90 percent of the tonnage of these fruits they handled in domestic markets outside the state, 5.4 percent in California markets, and 4.6 percent in offshore export markets.

TABLE 27

Change in Percentage of Total California Deciduous Fruits
Sold Fresh, Out of State, by Type of Fruit
1937-1939 to 1957-1959

Fruit	Percentage of fresh tonnage sold out of state		
	1937-1939	1957-1959	Change: 1957-1959 as com- pared to 1937-1939
Apples	21.6	17.5 ^a /	- 4.1
Apricots	34.7	37.6	+ 2.9
Cherries	48.9	63.7	+14.8
Grapes	88.5	86.3	- 2.2
Nectarines	<u>b</u> /	65.9	<u>b</u> /
Peaches Freestone	30.0	52.4	+22.4
Pears Bartlett	77.5	78.4	+ .9
Other	87.5	75.4	-12.1
Plums	79.9	82.5	+ 2.6
Average	73.1	75.5	+ 2.4

^a/ Average of 1957-1958 only.

^b/ No data available.

Source: Appendix Table A.8.

TABLE 28

Sales of First-Handing Firms: Markets and Sales Outlets Used and Share Sold by Sales Agencies by District, Type of Fruit Handled, and Cumulative Size Group, California, 1959

Classification	Markets			Sales outlets			Sales agencies
	Domestic outside of California ^{a/}	California	Export	Direct buyers	Terminal fruit auctions	Other types of buyers	
	percentage of total tonnage						
<u>District</u>							
1. Coachella	89.1	9.2	1.7	70.4	9.1	20.5	47.8
3. Bakersfield	86.3	12.6	1.1	45.4	22.0	32.6	45.6
4. Delano	73.7	16.8	9.5	33.2	33.6	33.2	45.8
5. Exeter-Visalia	73.5	12.5	14.0	56.5	9.8	33.7	85.6
6. Fresno-Minuba	81.4	14.6	4.0	51.7	8.2	40.2	36.4
7. Modesto	74.1	24.0	1.9	35.0	6.9	58.1	87.9
8. Lodi	82.1	10.1	7.8	54.0	14.9	31.1	42.6
9. Sacramento River	78.1	14.8	7.0	39.5	35.7	24.8	62.2
10. Placerville-Placer County	87.9	9.4	2.7	38.2	35.8	26.5	96.1
11. Winters-Brentwood	91.3	8.7	b/	10.8	69.3	19.9	84.1
12. Sebastopol	34.8	51.8	13.3	37.2	14.0	62.8	8.2
13. Lake-Mendocino	62.2	35.8	2.0	61.8	52.8	24.7	60.2
14. Northern California	71.0	27.3	1.7	22.5	23.2	60.4	79.4
15. Santa Clara-San Benito	55.6	18.6	25.8	16.4		56.6	28.9
16. Watsonville	3.6	92.6	3.8	43.4			
<u>Type of fruit handled</u>							
Apples	48.1	46.3	5.6	37.9	13.3	48.8	49.5
Apricots	65.0	29.0	6.0	65.5	22.4	12.2	31.0
Cherries	81.7	13.4	4.9	49.5	16.6	33.9	59.5
Table grapes	80.5	13.1	6.4	49.4	15.2	35.4	46.9
Juice grapes	80.2	12.1	7.7	48.5	17.4	34.2	34.8
Nectarines	79.3	15.7	5.0	48.2	10.8	41.0	47.8
Peaches	76.5	15.8	5.7	47.5	11.5	41.0	41.0
Pears	74.0	20.3	5.7	45.4	25.7	28.9	67.5
Plums	82.2	14.0	3.7	48.3	14.8	36.9	59.4
<u>Cumulative size group^{c/}</u>							
Largest 4	86.3	10.1	3.6	37.8	22.3	39.9	43.1
Largest 8	83.6	9.8	6.6	40.6	20.1	39.3	38.9
Largest 20	82.8	11.7	5.5	46.8	16.3	36.9	42.6
Largest 10 percent	82.1	12.1	5.8	43.1	16.7	35.2	41.3
Largest 50	79.4	15.3	5.3	48.9	16.1	35.0	49.5
Largest 25 percent	79.7	15.3	5.0	48.3	17.2	34.5	49.8
Largest 50 percent	77.3	16.4	6.3	47.5	17.2	35.3	50.2
Largest 75 percent	76.8	17.0	6.2	47.7	16.9	35.4	51.9
100 percent	76.5	17.4	6.1	47.5	17.1	35.4	52.2

a/ Includes Canada.

b/ Blanks indicate less than .1 percent.

c/ Firms ranked according to the magnitude of total tonnage of fresh deciduous fruits handled in 1959.

Source: Mail and interview surveys.

Table 29

Interstate Rail Passings and Unloads in Major United States Cities
Selected California Fresh Deciduous Fruits, 1960

Fruit	Total interstate rail passings carlots	Rail unloads					
		4 Northeastern cities ^{a/}		5 Midwestern cities ^{b/}		Total 9 cities	
		Number carlots	Percentage of total rail passings	Number carlots	Percentage of total rail passings	Number carlots	Percentage of total rail passings
Cherries	399	263	65.9	61	15.3	324	81.2
Grapes	22,166	8,345	37.6	2,965	13.4	11,310	51.0
Peaches	2,748	174	6.3	715	26.0	889	32.3
Pears	3,509	1,572	44.8	549	15.6	2,121	60.4
Plums	3,284	1,878	57.2	503	15.3	2,381	72.5
Total	32,106	12,232	38.1	4,793	14.9	17,025	53.0

a/ New York, Philadelphia, Boston, and Pittsburgh.

b/ Chicago, Detroit, St. Louis, Minneapolis, and Milwaukee.

Source:

U. S. Agricultural Marketing Service, Interstate Shipments of California Deciduous Tree Fruits, 1960 (San Francisco, 1961), pp. 16, 38, 48, and 62.

Idem, Marketing California Grapes, Raisins, and Wine, 1960 Season (San Francisco, 1961), p. 47.

TABLE 30

Truck and Rail Carlot Unloads at Los Angeles and San Francisco
Selected California Fresh Deciduous Fruits, 1960

Fruit	Total truck and rail unloads Los Angeles and San Francisco carlots	Truck and rail unloads			
		Los Angeles		San Francisco	
		Number carlots	Percentage of total for both cities	Number carlots	Percentage of total for both cities
Apples	1,802	1,032	57.3	770	42.7
Apricots	371	242	65.2	129	34.8
Cherries	190	138	72.6	52	27.4
Grapes	3,705	2,895	78.1	810	21.9
Nectarines	801	587	73.2	214	26.8
Peaches	2,905	2,144	73.8	761	26.2
Pears	853	667	78.2	186	21.8
Plums	790	648	82.0	142	18.0
Total	11,417	8,353	73.2	3,064	26.8

Sources:

U. S. Agricultural Marketing Service, San Francisco-Oakland Unloads of Fresh Fruits and Vegetables, 1960 (San Francisco, 1961), pp. 13-32.

Idem, Los Angeles Unloads of Fresh Fruits and Vegetables, 1960 (Los Angeles, 1961), pp. 10-26.

the total shipments going to these two cities in 1960 went to Los Angeles and 27 percent to San Francisco. Thus, on the basis of the Crop and Livestock Reporting Service estimate, about 49 percent of total intrastate shipments went to Los Angeles and about 18 percent to San Francisco.

The data presented in this section show that the major markets for these fruits are the United States and Canada. Exports to offshore markets play a relatively minor role in their distribution, although even the small percentage of exports may have a significant bearing on domestic market prices. Within the national market, specific regions consume a large proportion of some fruits, such as cherries and plums, a major share of which move to the large northeastern population centers.

Sales Outlets Used

The sales outlets used by California fresh deciduous fruit handlers and their sales agencies are firms operating on the wholesale level of distribution, including many that also operate on the retail level. These sales outlets have been aggregated into three principal categories for purposes of this discussion: direct buyers, terminal fruit auctions, and other buyers.

Direct Buyers.--In 1959, 47.5 percent of the fresh tonnage sold by first handlers responding to this survey went to direct buyers. These buyers include large-scale chain stores (operators of 11 or more stores), organizations purchasing for groups of retailers, and other firms handling a sufficient volume of these fruits at the retail level to justify purchase for direct shipment to their warehouses (or stores) from shipping points.^{1/}

Although chain-buying organizations have long purchased perishables for their stores, as late as 1950 the grocery wholesaler handling fresh produce was a rarity. However, in 1959, 42 percent of voluntary and cooperative wholesalers handled full lines of produce, and an additional 11 percent of voluntary and 6 percent of cooperative groups handled a limited line of produce.^{2/}

1/ Buying groups are of two types: a voluntary group which is sponsored by a wholesaler and operated under a common group name, such as IGA, and a cooperative group owned and operated by retailers using its services, such as Certified Grocers. See Progressive Grocer, Facts in Grocery Distribution (New York, 1960), p. 6.

2/ Ibid., p. 21.

It should be noted that direct sales, principally by first handlers selling their own fruit, may be made through buying brokers representing buyers in distant markets. These brokers offer their principals on-the-spot inspection and local knowledge of relative qualities and prices. So-called "cash buyers" operating in some districts often provide similar services, although these buyers generally take title to the fruit and resell it to their customers.

Terminal Fruit Auctions.--California first handlers sold 17.1 percent of their 1959 tonnage through fruit auctions operating in nine major cities of the United States: New York, Chicago, Philadelphia, Boston, Detroit, Pittsburgh, Cleveland, St. Louis, and Cincinnati. In addition, a juice grape auction operates in Jersey City.

In 1957 these auctions, not including Jersey City, handled about 6 percent of the total fresh market sales of deciduous fruits compared to about 9 percent in 1950. During the 1956-57 season, auction receipts of fresh deciduous fruits accounted for about 22 percent of the total unloads of these fruits in auction-market cities. In 1956, 59.8 percent of all fruit sold by these auctions went to jobbers, 13.7 percent to other types of wholesale handlers, 17.5 percent to retail organizations, and 9.0 percent to buying brokers whose principals were unknown.^{1/}

Other Buyers.--The remainder of these firms' 1959 tonnage (35.4 percent) was sold to other types of wholesale buyers. The principal type of buyer in this category is the wholesale receiver. These firms operate in market centers and purchase or receive on consignment fresh produce primarily for resale to jobbers or firms on the retail level.

Other types of firms operating on the wholesale level include the following:

1. Jobbers, who generally sell in small lots to retail customers.
2. Service wholesalers and purveyors, who provide individualized services to such customers as hotels, restaurants, ships, hospitals, and other institutions.
3. Repackers and prepackagers, who specialize in packaging services for retailers and other types of buyers.

^{1/} Alden C. Manchester, The Changing Role of the Fruit Auctions, U. S. Department of Agriculture, Marketing Research Report No. 331, 1959, pp. 5, 7, and 11.

4. Mixed-load distributors, who operate principally in California market centers. The chief function of this latter type of firm is the sale of truckload lots consisting of a mixture of various varieties and containers of fresh fruits and vegetables. Their principal services include locating the desired products for their customers, arranging for trucks required, and loading and manifesting the trucks in a manner that facilitates unloading at a number of points.

Difference in Sales Outlets Used Among Handler Categories

In general, there were only minor differences in the types of sales outlets used by the various types of first handlers. Commercial packers made the highest percentage of sales to direct buyers--52.0 percent of their tonnage compared to 47.1 percent for grower-shippers and 43.1 percent for cooperatives. Cooperatives sold 20.0 percent of their tonnage through auctions compared to 17.2 percent for grower-shippers and 14.3 percent for commercial packers. Other buyers received approximately equal percentages of the tonnage of each type of firm (see Table 28 for data on other classifications).

Changes in Types of Sales Outlets Used

Between 1950 and 1959 the tonnage sold to direct buyers by first handlers interviewed almost doubled. During this period, tonnage sold through fruit auctions by these handlers declined 35 percent, and tonnage sold to other buyers dropped 20 percent.

Differences in Sales Outlets Used by Agencies

About 52 percent of the aggregate tonnage of first handlers is sold through sales agencies. Although this tonnage is reflected in the sales data for all first handlers presented above, it is interesting to note that the pattern of outlets used by the agencies interviewed differed somewhat from that indicated for all handlers. For example, in 1959 these agencies sold only 29.5 percent of their tonnage to direct buyers as compared to 47.5 percent indicated by all first handlers. In that year 23.7 percent of agency tonnage was sold through auctions and 46.8 percent went to other buyers as compared to 17.1 percent and 35.4 percent, respectively, for all first handlers. Hence, sales outlets used by first handlers selling their own fruit apparently differ to some extent from those used by sales agencies.

There are significant differences in the use of sales agencies by the various categories of first handlers. Grower-shippers sold 42.9 percent of their volume through agencies; cooperatives, 73.4 percent; and commercial packers, 68.2 percent (see Table 28 for data on other classifications).

SUMMARY--PRODUCTION, UTILIZATION, AND MARKETING INSTITUTIONS

The production changes that have occurred during the past 30 years are evidence of the increased commercialization of this industry. Production has been intensified in higher yielding areas. There has been a gradual shift in the location of acreage, with the greatest change taking place since 1950. Increasing concentration of acreage in the San Joaquin Valley has been one of the striking characteristics of this change. These fruits are being grown on fewer and larger farms, and production of many varieties has centered in relatively small, specialized districts. This is reflected in the geographical pattern observed in Figure 3.

These changes are closely related to many of the adjustments taking place in the industry's marketing institutions. District specialization and shifts in location of production require new or enlarged packing, shipping, and storage facilities in expanding areas and probable retrenchment in others. As size of holdings increases, more grower-operated facilities may be feasible. Organizational arrangements among producers and handlers are likely to need adjustment to changed relationships.

During the past two decades an increased percentage of many of these fruits has moved to processors. Total per capita consumption of these fruits, fresh and processed, declined about 25 percent during the past 30 years; however, fresh per capita consumption declined about 52 percent during these years.

These consumption and utilization trends affect tonnage moving through many fresh-handling facilities. If total fresh volume is reduced, unit costs of packing and selling these fruits through established institutions may rise. If grower returns from fresh utilization are decreased in this manner, relatively greater tonnage can be expected to move to processing.

Seasonality of harvesting and marketing is a major factor in the organization of this industry. Seasonal harvesting peaks last from one to three

months. Marketing periods are extended through use of cold storage for the more durable fruits. The storage life of deciduous fruits varies from about a week for cherries and apricots to as long as six to seven months for some varieties of apples, pears, and grapes. Handlers and sales agencies must consider these seasonality factors in decisions relating to expansion, diversification, internal organization, and external relationships. Effective utilization of facilities and personnel is likely to hinge on the ability of firms to adapt efficiently to seasonality.

The number of varieties of these fruits shipped in interstate trade has declined significantly during the past 25 years. Concentration on fewer varieties may intensify seasonal peaks in specialized districts. Districts which have largely produced varieties no longer favored in the commercial trade may find their markets diminishing with decreasing need for existing facilities and organizations.

Production and utilization characteristics of these fruits provide the setting for the institutional organization of this industry. This study focuses on the two principal segments of the marketing system for fresh deciduous fruits in California--first handlers and their sales agencies. Data relating to the structure, organization, and practices of these segments plus such quasi-governmental institutions as have been developed under marketing orders indicate the important features of the seller's side of the market for these fresh fruits.

Results of this study indicate that about two-thirds of the state's first handlers of fresh deciduous fruits are grower-shippers, approximately 19 percent are commercial packers, and 15 percent are cooperative associations. Each of these types of firms handles a percentage of the total tonnage approximately equal to its percentage of the total number of facilities.

Although there is considerable variation among the types of firms operating in the various districts and handling the various types of fruits, grower-shippers tend to predominate in most districts. These firms are defined here as those that grow any portion of the fruit handled. About one-half of the grower-shippers pack only their own fruits, and over 75 percent of these firms grow at least 50 percent of the fruit packed. Cooperatives are most numerous in the tree fruit districts, particularly in pear-producing areas. Commercial packers are of relatively greater importance in the tree fruit districts than in the grape districts.

Among the grower-shippers, more than two-thirds of the firms are single proprietorships or partnerships, and the remainder are largely closely held or family corporations. Hence, control of these firms generally rests with one or only a few individuals. Less than 6 percent of the local grower-shipper operations are controlled by other firms, whereas 40 percent of the local commercial handling plants are so controlled.

Only about 5 percent of the first handlers pack commodities other than deciduous fruits. About 50 percent of the state's first handlers operate cold storage or precooling plants. Sixty-one percent of the cooperatives operate such plants compared to 48 percent of the grower-shippers and 47 percent of the commercial packers.

Facilities utilized by first handlers vary widely in size and complexity and, hence, in investment required. For example, grapes may be field packed, hauled to a loading platform, loaded, and cooled in the railcar or truck in which they are shipped. On the other hand, grapes may move through highly mechanized, large-scale packinghouses to adjacent specialized cold storage plants for storage or cooling prior to loading for shipment. The facilities involved in these two procedures illustrate the extremes in this industry. However, between these are a wide variety of first-handling procedures utilizing a great many variations of physical plant and equipment. These variations make generalizations as to facilities requirements and handling practices both difficult and hazardous.

Many packinghouses are old, but a high proportion of them have been re-modeled to accommodate new equipment or handling methods. Cold storage plants are relatively new. Those represented in this study averaged only eight years of age. Prepackaging and bulk filling of containers are being done, but lack of market demand has resulted in little expansion of these procedures. Bulk bins are being increasingly utilized in orchard-to-plant hauling of some tree fruits, principally pears and apples. The rapid expansion of truck transportation has required new and revamped physical facilities and handling methods. The demand for mixed truckloads is leading to the development of facilities for consolidation of loads at centralized points within the producing areas.

Procurement agreements between first handlers and growers and between sales agencies and first handlers are generally informal, and where formal contracts exist they are seldom rigidly enforced. Of the total tonnage of

these fruits moving to first handlers included in this study, about 45 percent is grown by the firms themselves; and approximately 47 percent is handled on consignment, including cooperative tonnage in this category. The remaining 8 percent of the fruit is purchased by these firms.

About 50 percent of the state's first handlers sell more than 75 percent of their fruit through sales agencies, and the remaining firms sell most of their fruit themselves. Most of the agency sales are apparently made through firms that have been defined in this study as California sales agencies. Of the 10 agencies interviewed in the course of this study, 1 is a cooperative and 9 are commercial companies. The 5 largest volume agencies handle sales for about 170 local facilities, including 33 of their own branches or affiliates. Most of these agencies handle all of the major deciduous fruits and at least one other commodity.

Both agencies and first handlers selling their own fruit utilize brokers in major market centers to some extent, but an increasing share of sales are made to firms represented by buyers in the producing districts. This shift has generally led to greater sales responsibility at the shipping point, and packinghouse managers and sales agency field representatives have assumed a larger role in selling.

F.o.b. shipping point terms are utilized for 90-95 percent of all sales other than auction. Practically all sales are made on a day-to-day basis. Sales contracts covering shipments more than a week in advance are seldom used, although block sales (which involve a stated amount of fruit, at an established price, to be shipped over a longer period) are evident to a relatively minor extent.

Marketing orders--federal and/or state--are in effect for most of California's major fresh deciduous fruit crops with the exception of grapes, other than Tokays. The regulations and organizations established under these orders have added a dimension to the industry outside of the established channels of distribution. Under these orders, grade, size, maturity, and/or shipping quota regulations can be established, and these are enforceable by the federal or state government.

In general, the regulations imposed under these orders have tended to become more restrictive over the period of their existence. Evaluation of

the net effects of these orders is outside of the scope of this study; however, it seems apparent that many of the regulations established probably reduce the total volume shipped fresh, at least in the short run, and restrict the operational flexibility of producers, first handlers, and sales agencies.

About 75 percent of these fresh fruits are sold in domestic markets outside of the state and in Canada, with the major share going to the large population centers of the Midwest and Northeast. Tonnage sold in California has increased during the past decade and accounts for almost 20 percent of the total sales. The remaining 5 or 6 percent of the annual tonnage is sold in offshore export markets.

Sales to direct buyers--principally chain stores and buying groups--doubled between 1950 and 1960 and in the latter year accounted for almost one-half of the total sales volume. Sales through terminal auctions declined about 35-40 percent during this period.

As evidenced by the data presented in this report, the California fresh deciduous fruit industry is a group of production and marketing firms varying widely in many important characteristics. Differences in size and location of acreage and type and variety of fruit produced are major variations among growers. Heterogeneity among first handlers stems from differences in age and type of firms, location, type of fruits handled, and size of operations. In addition, there are differences in functions performed, facilities operated, and sales outlets used. Similarly, sales agencies vary in many important respects.

Under these conditions, marketing policies and practices of individual firms are likely to vary widely. Timing and manner of adjustment to changing production and marketing conditions will differ according to the specific characteristics of the firm and the context within which it operates.

The complexity of an industry such as this, made up of many relatively small firms with differing economic characteristics, renders composite industry analysis difficult and hazardous. Recognition of this situation is implicit in the remainder of this report where many of the data that have been presented are utilized in a discussion of the competitive position and marketing efficiency of this industry.

COMPETITIVE POSITION OF THE INDUSTRY

In traditional economic analysis, the competitive nature of markets is usually described in terms of certain attributes of the products and the relations between buyers and sellers. The concept of perfectly competitive markets involves a great many buyers and sellers dealing in a homogeneous commodity, with all participants possessing complete market knowledge. Under these conditions, individual sellers exert no influence on the prices received for their product. At the other extreme in this framework is monopoly, characterized by one seller with a unique product in complete control of his price and product policies.

The characteristics of the markets for almost all products lie between the extremes of perfect competition and monopoly. Such markets may be composed of a few sellers of a homogeneous product or of a differentiated product. However the most common situation is one in which there are many sellers, and it is recognized that each seller's product is differentiated in some respect from that of the others.^{1/} Under this condition, the differentiating characteristics--possibly only the name or location of the seller--allow the seller to pursue his own market policies to some extent.

The degree to which sellers--or buyers--can effectively pursue their own price and product policies is of major significance in the differences found in the structure and organization of markets. This is the field of study specifically considered in market structure analysis.

Market Structure Analysis

Three recognized elements of market structure analysis have been termed market structure, market conduct, and market performance. Structure refers to the organizational relationships among buyers and sellers in a market. Conduct refers to the patterns of behavior which firms follow in the markets in which they buy or sell. Performance refers to the composite of end results as to

^{1/} This is termed monopolistic competition. See Edward H. Chamberlin, The Theory of Monopolistic Competition: A Re-orientation of the Theory of Value ("Harvard Economic Studies," Vol. 38; 5th ed.; Cambridge: Harvard University Press, 1946), pp. 68-70.

price, output, costs, product design, and so forth, which firms arrive at in the market as they pursue their particular line of conduct.^{1/}

In analyzing the structure of a market, major emphasis usually is given to specific structural characteristics such as: (1) the degree of concentration of buyers and sellers, (2) the nature of product differentiation, (3) the conditions of entry for potential entrants, and (4) the extent of horizontal and vertical integration.

The determinants of seller concentration studied may include such factors as the existence of scale economies in individual plants or firms, economies of vertical integration, the existence of barriers to entry, or other advantages of large operations. An appraisal of product differentiation involves the reasons for buyer preference for the product of one firm over another such as developed through advertising and sales promotion. The condition of entry may be largely determined by the nature of cost advantages of established firms, product differentiation advantages of such firms, and significant economies of large-scale firms.^{2/}

The study of horizontal integration involves examination of the extent of centralized control over a number of operating units on the same level of the production and distribution system. Vertical integration applies to such control over operating units on different levels of the system. Either type of integration may affect other structural variables.

The interrelationship among these structural characteristics is apparent. Concentration may be increased through horizontal integration. Entry barriers may be raised by control of strategic production factors or distributive channels through vertical integration. Scale economies may be realized through some type of integration. Hence, application of the classification suggested to evaluation of the structure of a market on the basis of these variables requires recognition of their interdependence.

Appraisal of the competitive position of an industry requires measurement of relevant characteristics. For example, the degree of concentration may be

^{1/} Joe S. Bain, Industrial Organization (New York: John Wiley & Sons, Inc., 1959), pp. 7-11.

^{2/} Bain, Barriers to New Competition: Their Character and Consequences in Manufacturing Industries (Cambridge: Harvard University Press, 1956), pp. 3 and 15-16.

measured by the percentage of total sales or total physical volume controlled by the largest 4, 8, or 20 firms in the industry. However, for many attributes, qualitative estimates are often the only measures available. Marketing efficiency can be evaluated in terms of the degree to which firms in an industry achieve available economies of scale or vertical integration. Utilization of facilities and the extent of overcapacity are other factors related to efficiency. Adoption of new techniques in product handling and distribution may be related to marketing efficiency achieved. Allocation of product among alternative markets so as to achieve optimum returns would be indicative of efficiency in marketing.

In general, both competitive position and marketing efficiency can be appraised by comparing observed structural characteristics of an industry with a particular theoretical model. Usually, deviations from characteristics associated with perfect competition are noted and their implications evaluated.

Definition of the Industry

In this study, the California fresh deciduous fruit industry has been defined as that segment of the state's deciduous fruit industry that is principally concerned with marketing these fruits in fresh form. This includes each of the individual industries often defined for each type of fruit, such as the California plum industry, but only the fresh marketing institutions are considered. The specific segments of this industry upon which the study is focused are first handlers and California sales agencies. These firms are in direct contact with the growers and with the other levels of the marketing system for these fruits. Firms at these levels are generally the "sellers" of these fresh fruits and specialized in their marketing.

Although many of these fruits are utilized in the processed form and the processed product may be a substitute for the fresh product to some degree, the marketing channels are not the same and the products are considered separate commodities by the trade at all levels. Due to the varying shares of the various types of fruit that move to processors, no exact determination of the "fresh industry" is possible; however, it is not necessary for the purposes of the present analysis. Those cases in which utilization in both the fresh and processed forms allows "entry" from one sector to the other are discussed in sections dealing with this problem.

MAJOR ELEMENTS OF MARKET STRUCTURE AND ORGANIZATION

Certain aspects of the structure and organization of the California fresh deciduous fruit industry and its markets seem to bear significantly on price and income determination and other performance characteristics, such as marketing efficiency. Among the major structural variables discussed in the preceding section, the following are believed to be of major importance: (1) degree of seller concentration, (2) product differentiation, (3) entry conditions, and (4) extent of integration.

Degree of Seller Concentration

The degree of concentration in an industry refers generally to the amount of total industry output controlled by specified numbers of firms. In this study, net tonnage of fruit packed and shipped is used as the measure of volume of output of the industry. Sales control of this tonnage is utilized as a measure of the degree of concentration.

Distribution of Tonnage--First Handlers

Table 31 presents the distribution of the total tonnage of fresh deciduous fruits handled by first handlers responding to the surveys according to the cumulative size categories defined.^{1/} These data indicate that, of the total tonnage represented, 12.1 percent was handled by the 4 largest firms, 20.4 percent by the largest 8 firms, and 35.6 percent by the largest 20 firms. The largest 10 percent of the firms responding pack and/or ship 39.3 percent of the total tonnage, and the largest 25 percent handled 64.0 percent of the total.

In terms of individual fruits, it is apparent from Table 31 that in no case does the largest 10 percent of these first handlers control more than 50 percent of the total tonnage of any one fruit. However, more than 50 percent of the total volume of table grapes, juice grapes, nectarines, peaches, pears, and plums is handled by the largest 25 percent of these firms. In contrast, more than 50 percent of the cherry tonnage and 68 percent of the apricots are handled by the smallest 50 percent of the firms.

^{1/} Cumulative size categories are based on total tonnage handled by first handlers ranked from largest to smallest.

TABLE 31

Distribution of Total Tonnage and Tonnage of Each Type of Fruit Among First-Handling Firms
by Cumulative Size Groups, California, 1959

Cumulative size group ^{a/}	Percentage of total tonnage ^{b/} handled	Percentage of total tonnage of each type fruit								
		Apples	Apricots	Cherries	Table grapes	Juice grapes	Nectar- ines	Peaches	Pears	Plums
Largest 4	12.1	5.5	0	0	14.2	6.3	2.8	4.2	17.9	13.1
Largest 8	20.4	5.5	0	0	24.0	26.2	9.4	14.5	17.9	19.7
Largest 20	35.6	5.5	0	0	40.0	37.2	25.4	36.8	33.8	32.4
Largest 10 percent	39.3	5.8	0	0	43.8	41.9	35.8	41.8	33.8	38.0
Largest 50	58.6	39.9	30.7	18.5	65.5	56.7	47.7	53.4	48.4	61.0
Largest 25 percent	64.0	39.9	30.7	27.7	69.3	57.6	62.4	62.4	56.7	68.9
Largest 50 percent	85.9	77.6	32.0	49.1	88.4	83.8	78.7	78.2	88.3	90.4
Largest 75 percent	96.6	92.5	68.2	67.1	97.4	99.0	93.9	92.8	97.2	99.0
100 percent	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

^{a/} Firms ranked in order of magnitude of total tonnage of fresh deciduous fruits handled.

^{b/} Total tonnage of firms responding to mail and interview surveys.

Source: Mail and interview surveys.

Distribution of Tonnage--Sales Agencies

The sales agencies interviewed in the course of this study are known to include those selling the largest volume of these fresh deciduous fruits. In 1959 these 10 agencies sold 32.4 percent of the estimated total fresh disappearance of these fruits produced in California (see Table 32). The five largest volume agencies sold 26.8 percent of the total fresh disappearance. The two largest firms handled 15.1 percent of the total fresh sales of these fruits.

Although percentages of the total tonnage of individual fruits sold by these agencies vary widely, they can be used as an indication of the concentration of sales control of each fruit. As shown in Table 32, tonnage sold by the five largest agencies varies from almost 64 percent of the total fresh pears to only 1.6 percent of the total fresh apples. With the exception of pears, the highest degree of sales control of an individual fruit occurs with plums, with the five largest agencies controlling 36.9 percent of the total volume. Tonnage sold by the 10 firms interviewed ranges from 70.8 percent of the total fresh pears to 4.2 percent of the apples produced in the state.

Distribution of Tonnage Among Districts

An additional element in the degree of sales control of these fruits is the manner in which such control may shift during the season as the center of harvesting and marketing activity moves from district to district and from one variety to another. Tonnage controlled by certain percentages of sales agencies or first handlers varies among the districts; hence, sales concentration changes according to time periods and specific varieties.

Table 33 indicates the percentage of the total state tonnage and the percentage of each fruit that is shipped from each district, and Table 34 summarizes the percentage distribution of types of fruit shipped from these districts. The dominance of the Fresno-Dinuba district in the shipment of these fruits is apparent, with almost 34 percent of the total tonnage shipped from this district. Two northern districts--Placerville-Placer County and Lake-Mendocino--ship over 70 percent of the state's fresh pears.^{1/}

- - - - -

^{1/} The incidence of "pear decline" in the Placerville-Placer County district since 1959 has probably reduced this percentage to some extent.

TABLE 32

Total Fresh Disappearance of Selected Deciduous Fruits and Shares Sold by Major Sales Agencies
California, 1959

Fruit	Total fresh disappearance	Sold by 10 major sales agencies ^{a/}	Percentage of total fresh disappearance sold by:		
			10 major sales agencies	The 5 largest-volume sales agencies	Agency selling largest tonnage each fruit
	thousand	pounds			
Apples	144,000	6,105	4.2	1.6	1.5
Apricots	21,000	6,823	32.5	27.7	22.1
Cherries Sweet	12,200	3,465	28.4	19.2	7.6
Grapes	1,057,400	329,188	31.1	25.9	8.5
Nectarines	75,200	15,011	20.0	15.9	8.8
Peaches Freestone	223,400	29,895	13.4	7.8	2.6
Pears	214,600	151,633	70.8	63.8	32.9
Plums	170,600	78,598	46.1	36.9	14.1
Total	1,918,400	620,718	32.4	26.8	

^{a/} Net weight of packed containers sold by the 10 major sales agencies interviewed.

Source: Total fresh disappearance data from Appendix Table A.7, and sales agency data from interview survey.

TABLE 33

Distribution of Total Tonnage and Tonnage of Each Type of Fruit Among Shipping Districts
California, 1959

District	Percentage of total tonnage shipped, all districts ^{a/}	Percentage of total tonnage of each type fruit								
		Apples	Apricots	Cherries	Table grapes	Juice grapes	Nectar- ines	Peaches	Pears	Plums
1. Coachella	2.8	b/			5.5					
3. Bakersfield	8.8				14.8		.2	1.7		12.7
4. Delano	13.0				23.4	16.7	.1	.1		
5. Exeter-Visalia	11.2				16.6	.4	10.8	9.7		16.2
6. Fresno-Dinuba	33.6	.5			30.1	58.4	76.3	78.0		38.5
7. Modesto	1.3				.2	3.1	9.4	6.7		.3
8. Lodi	7.4			66.0	9.4	21.4	1.9	.9		1.8
9. Sacramento River	1.8								13.0	
10. Placerville-Placer County	7.9	5.5						.5	37.5	24.0
11. Winters-Brentwood	.7		100.0	1.2			.8	.5	1.8	.9
12. Sebastopol	1.1	26.8								
13. Lake-Mendocino	4.8								34.0	c/
14. Northern California	1.2						.5	1.9	3.4	5.5
15. Santa Clara-San Benito	1.7			32.8					10.3	
16. Watsonville	2.7	67.2								.1
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

^{a/} Total tonnage of firms responding to mail and interview surveys.

b/ Blanks indicate no shipments by responding firms.

c/ Less than .1 percent.

Source: Mail and interview surveys.

TABLE 34

Tonnage of Each Type of Fruit Shipped as a Percentage of Total Tonnage Shipped from Each District
California, 1959

District	Percentage of total tonnage of each district ^{a/}								
	Apples	Apricots	Cherries	Table grapes	Juice grapes	Nectarines	Peaches	Pears	Plums
1. Coachella	b/			100.0					
3. Bakersfield				84.3		.1	1.8		13.8
4. Delano				89.9	10.0	c/	.1		
5. Exeter-Visalia				74.1	.3	4.1	7.7		13.8
6. Fresno-Dinuba	.1			44.8	13.7	9.6	20.7		11.1
7. Modesto				6.0	18.4	29.5	44.1		2.0
8. Lodi			6.5	65.5	23.5	1.1	1.1		2.3
9. Sacramento River								100.0	
10. Placerville- Placer County	2.8						.6	67.2	29.4
11. Winters- Brentwood		48.8	1.2			4.8	6.6	25.9	12.7
12. Sebastopol	100.0								
13. Lake-Mendocino								99.9	.1
14. Northern California						1.7	14.1	39.5	44.7
15. Santa Clara- San Benito			13.8					86.2	
16. Watsonville	99.6								.4

^{a/} Total shipments of first handlers responding to mail and interview surveys.

b/ Blanks indicate no shipments by responding firms.

c/ Less than .1 percent.

Source: Mail and interview surveys.

As shown in Table 35, the largest four first handlers control a high percentage of the total shipments from many districts. For example, among the handlers responding to the survey in the Bakersfield, Sebastopol, and northern California districts, the largest four firms in each district handle more than 90 percent of the total tonnage of all firms responding.

An additional indication of sales control of tonnage among the districts is available from the data relating to the percentages of total district tonnage sold by agencies. The following data from the surveys show the districts in which more than 50 percent of the fresh deciduous fruit tonnage is sold through agencies.

<u>District</u>	<u>Percentage of tonnage sold through agencies</u>
10. Placerville-Placer County	96.1
7. Modesto	87.9
5. Exeter-Visalia	86.6
11. Winters-Brentwood	84.1
15. Santa Clara-San Benito	79.4
9. Sacramento River	62.2
14. Northern California	60.2
13. Lake-Mendocino	56.4

These figures suggest that, if these districts are sufficiently differentiated from others in terms of timing, varieties, trade acceptance, or other factors, a relatively high degree of control over sales in the district may be possible.

Other Factors Relating to Sales Control

It must be recognized that competition from similar fruit produced in other regions of the United States and substitution of other products reduce the effectiveness of the sales control indicated above. In addition, another factor should be considered. As shown in the section on procurement, much of the fruit offered for sale by first handlers is not owned by them. Approximately 31 percent of the tonnage is handled on a consignment basis, and 16 percent is handled on a similar basis by cooperatives for members. Hence, title to almost half of the tonnage packed and shipped remains in the hands of producers other than grower-shippers until the fruit is sold by the first handler.

Among the 10 California sales agencies studied, 81.7 percent of the tonnage sold is handled on an agency basis. Only the remaining 18.3 percent is actually owned by the sales agency at time of sale. Thus, it seems apparent

TABLE 35

Percentage of Total Tonnage of Fresh Deciduous Fruits
in Each District Handled by the 4 Largest-Volume
First-Handling Firms in the District, 1959^{a/}

District	Percentage of total tonnage handled by 4 largest-volume first-handling firms
1. Coachella	75.9
3. Bakersfield	92.2
4. Delano	53.4
5. Exeter-Visalia	41.4
6. Fresno-Dinuba	23.5
7. Modesto	62.4
8. Lodi	38.0
9. Sacramento River	85.0
10. Placerville-Placer County	65.7
11. Winters-Brentwood	85.5
12. Sebastopol	90.9
13. Lake-Mendocino	70.1
14. Northern California	92.9
15. Santa Clara-San Benito	80.8
16. Watsonville	77.9

^{a/} Refers to total tonnage of firms responding to the mail and interview surveys.

Source: Mail and interview surveys.

that the nature of the procurement arrangements between these agencies and their first-handler accounts and between the handlers and their growers is an important factor in the degree of sales control actually achieved by these sellers. These arrangements are generally informal, and the sellers seldom are granted absolute authority in respect to sales. Hence, actual sales control may be even less than would appear from the above data.

In summary, data developed in this study indicate that the sellers' side of the market for California fresh deciduous fruits has two major elements. About 52 percent of the tonnage available is sold by sales agencies, predominantly those described here as California sales agencies. The balance--48 percent--is sold by first handlers themselves. The grower--either a grower-shipper or a grower consigning his fruit to a first handler--holds title to about 92 percent of the fruit offered for sale. The other 8 percent is purchased by first handlers prior to packing or shipping. Concentration is generally low, with the five largest agencies controlling only 27 percent of total fresh tonnage available. For most fruits, not until more than 50 of the largest volume first handlers are included does the share of total tonnage controlled surpass 50 percent. The degree of sales concentration may be somewhat higher for specific fruits and during specific portions of the season.

Product Differentiation

The differentiation of California fresh deciduous fruits from those produced in other areas is an important factor in the distinctive identification of these fruits. Industry-wide promotion and advertising programs carried on under marketing orders emphasized this differentiation.

Another general type of differentiation is applied to fruit produced in the different districts of the state. Fruit from certain districts is identified in order to take advantage of any trade opinion that such fruit has superior characteristics compared to similar fruit produced in another district. Thus, labels may identify "Lake County Mountain Bartletts" or "Brentwood Apricots," and trade journal advertising may stress the production area, such as "Delano District Grapes Now Available."

The sources of differentiation that have the greatest meaning for market structure are those utilized by individual sellers with the industry. Among these sources are the following: (1) grading and inspection; (2) methods of

packing, handling, and shipping; (3) reputation and years in business; and (4) establishing and publicizing brand names and other forms of advertising.

Grading and Inspection

U. S. grades have been established for all of the fruits considered in this study. Approximately 75 percent of the fruit handled by the firms interviewed is inspected and graded in accordance with standards incorporated in these grades.^{1/}

The use of a standard system such as the U. S. grades should lead to less differentiation among these products, and, to the extent that brands are simply packed to meet the minimum standards of U. S. No. 1, for example, this is the result. However, the wide variation in qualities of fruit and pack allowable within the tolerances of a single grade makes possible considerable differentiation. Thus, a handler may consistently pack under a given label with a percentage of defects lower than is allowed under the grade. In this manner, a range of differentiation is possible even though the pack is directly related to the standards.

Many handlers rely largely on their own established grades as packed under their various labels, and these may be generally unrelated to U. S. grades. This is especially true of grape shippers and also many tree fruit handlers. These firms have used the auction markets as a "showcase" for their brands, and they often attempt to base f.o.b. price premiums on the differentials their brands receive in the auctions.

Methods of Packing, Handling, and Shipping

Differentiation may be achieved by particular packing and trimming methods. Certain types of boxes, pads, and liners; special cooling methods; or any other practice deemed unusual enough to aid in differentiating the handler's products from those of others may be used and widely publicized to the trade.

Express shipment, as opposed to regular freight service, is used by some shippers of the more perishable fruits so as to place the fruit on the eastern market about two days earlier. The express shipments are so designated in auction catalogs, and a few shippers attempt to identify their fruit with this type of service and thereby obtain a form of differentiation.

^{1/} Firms handling fruit for which inspection is not required under a marketing order had only 64.4 percent of their fruit inspected, and firms handling only grapes had only 58.8 percent of their fruit inspected.

Some firms--handlers and sales agencies--provide extra services in order to differentiate their product. These might include special manifesting or billing procedures, tailoring orders to specific buyer needs, developing mixed-load consolidation facilities, or other such "nonprice" incentives for buyers.

Reputation and Years in Business

Firms with a long history of reputable business practice in this industry exploit this type of differentiation for the products handled. First handlers responding to the survey had been in business an average of 26 years. The average age of the sales agencies contacted was 42 years in 1960. Many of these first handlers and agencies advertise their long years in business in trade journals as a differentiating factor.

Brand Name Advertising

About one-half of the first handlers interviewed advertise their brands in trade publications, and most of the sales agencies also advertise in this manner. Two agencies have established insignias which are superimposed on the individual labels of their first handlers' brands. These insignias are used in trade paper advertising, point-of-purchase displays, and to a very limited extent in consumer publications.

In general, the amount of money spent on brand advertising by either sales agencies or first handlers is insufficient to build much brand consciousness. These programs are not aimed at the consumer level, and brand identification is rarely carried through to that level except to the minor degree that it is used in connection with prepackaged fruit.

Summary--Product Differentiation in This Industry

Firms in this industry utilize various combinations of the available methods discussed here to differentiate their products and services. An economic study of the factors related to the prices received for two varieties of table grapes in auction markets found that brand name and mode of shipment--express or freight--were significantly related to price premiums received.^{1/} The authors recognized, however, that these relationships may partly reflect the combination of fruit characteristics typically associated with these two

^{1/} Ivan M. Lee and H. B. Richardson, Factors Related to Auction Price Premiums--Fresh Thompson Seedless and Tokay Grapes, University of California Giannini Foundation Mimeographed Report No. 160 (Berkeley, 1954), p. 43.

factors. These characteristics include consistent packing of a certain quality of fruit under a specific label, use of special packing materials in connection with a label, and any other practice that might be consistently related to a particular packer's label.

There is little indication that large-scale sellers, such as the major sales agencies, have any distinct advantage over smaller handlers in relation to product differentiation. These fruits are generally packed under the label of the local handling operation, even when these are local units of a statewide or nationwide sales organization. The two sales agencies using insignias usually place these on the label of the local facility. Differentiation among districts is a major factor in this practice, and the fact that statewide labels are not widely used would seem to indicate that this consideration overrides the advantages of selling under a single label.

Condition of Entry

The major advantages of established firms in an industry may stem from high entry barriers due to heavy investment requirements, control of strategic resources, product differentiation, and the nature of the economies of large-scale firms or plants. The established firms in this industry are the growers, first handlers, and California sales agencies. However, in this study, growers are not considered sellers unless they operate as a grower-shipper with facilities at least comparable to the smallest commercial or cooperative first handler. Entry to these industry segments can come from below, that is, from the grower level; from above, that is, from the wholesale or retail level; from established firms in the industry through the acquisition of new facilities or engaging in new functions; or from new or existing firms in none of these categories. Ease of entry may vary among these categories of potential entrants.

Investment Requirements

Estimates of the 1960 replacement cost of their existing facilities by first-handling firms interviewed varied from as low as \$115,000 for a grape packinghouse with an hourly output rate of about 800 lugs and no cold storage or precooling facilities to as high as \$2,250,000 for a large pear packinghouse with an hourly output rate of about 2,000 standard boxes and a cold storage plant with a capacity of about 500 cars. Estimated replacement costs of

interviewed firms with cold storage plants averaged \$840,000, while those with only precoolers averaged \$203,000 and those with neither of these facilities averaged about \$119,000.

Another source of estimated replacement costs is a study of the plant and equipment requirements in grape packing plants.^{1/} Cost data were developed for such plants (with no precooling or cold storage facilities) using hand trucks for intraplant transportation. In terms of 1958 costs, these data for various plant sizes are shown below:

<u>Plant size: rate of output</u> <u>in lugs per hour</u>	<u>Estimated cost of plant</u> <u>and equipment, 1958</u>
200	\$36,526
400	43,678
600	61,495
900	75,499
1,200	94,453

To the investment required for plant and equipment must be added initial operating capital needs. The extent of this barrier to entry depends upon the ability of the various potential entrants to obtain the total capital required. While it is impossible to generalize on this problem, it is unlikely that traditional banking institutions would lend more than 50 percent of the costs of the facilities unless other mortgageable assets were used for security.^{2/} Thus, on the basis of the above example based on grape packing, the entrant would need equity capital of from \$20,000 to \$50,000 plus a source of operating capital. However, it must be noted that adequate facilities can be leased in some cases, and many of these fruits can be field or ranch packed utilizing very limited physical facilities.

In practice, there is probably no accurate way to determine the entrant's disadvantage in acquiring funds for capital investment relative to established firms. About all that can be done is to suggest, as Bain has: "There is probably some progression of the entrants' disadvantage and the height of the resultant barrier to entry with the increase in capital requirements."^{3/}

^{1/} L. L. Sammet, "Economic and Engineering Factors in Agricultural Processing Plant Design" (unpublished Ph.D. dissertation, Department of Agricultural Economics, University of California, 1958), p. 344.

^{2/} Based on information supplied by an official of the Berkeley Bank for Cooperatives in March, 1960.

^{3/} Bain, Barriers to New Competition: . . . , p. 167.

Control of Strategic Resources

There is little evidence that most of the processes and materials used by first handlers in the production of the finished product--packed fruit--are any more readily available to established firms than to entrants. The principal exception to this may be the fruit itself. It is the ownership and/or control of the fruit that may provide the greatest barrier to some potential entrants.

Data presented earlier in this report indicate the grower-shipper is a major factor in the area of the state where production is increasing--the San Joaquin Valley. About 78 percent of the first handlers in the four districts from Fresno to Bakersfield are grower-shippers, and these firms grow 51.4 percent of the tonnage they handle. This compares with statewide averages, which indicate that 66 percent of first handlers are grower-shippers who produce 44.7 percent of the fruit handled. The importance of the grower-shipper is also evidenced by the survey estimates that almost 80 percent of total table grape tonnage, 71 percent of the peaches, 70 percent of the nectarines, and 68 percent of the juice grapes are packed and shipped by this type of firm.

Generally, the majority of the fruit packed by grower-shippers is grown by them, with the balance of their pack obtained on consignment from other growers. Relatively little fruit--about 8 percent--is purchased from growers by any of the various types of first handlers. Of the total tonnage handled, about 47.3 percent is on a consignment basis, including cooperative tonnage. Hence, entry into first handling involves either entering the producer segment also or procuring fruit from other growers in some manner. This latter alternative probably involves one of two possible procedures: (1) purchasing desired tonnage, largely from that block of fruit now handled on consignment, or (2) competing with established handlers for consignment accounts.

Purchasing fruit might be the method most likely to assure an entrant of adequate supplies; however, this shifts much of the market risk to the first handler and considerably increases the total risk involved for the entering firm. The prevalence of informal procurement arrangements between growers and existing first handlers reduces the likelihood of an entering firm being able to assure itself of supplies for a long enough period to justify investment in the required facilities. However, formal contracts tied to producer financing by the entrant should bring about such assurance of supplies, but this will also increase the amount of capital required for entry.

In general, it appears that the potential entrant to this industry is likely to find it difficult to procure adequate fruit supplies without either producing at least a part of that supply, engaging in substantial grower financing, or purchasing the fruit outright. Any of these procedures dictate a substantial increase in the initial capital requirements over those indicated for facilities only.

Product Differentiation

Differentiation has been discussed earlier as a factor in market structure, and it is considered here only in relation to entry conditions. Among the types of differentiation considered, only that involving "reputation and years in business" seems to offer any substantial barrier to entry. The importance of this factor is indicated by the fact that, among the first handlers and sales agencies interviewed, from 80 to 100 percent of their sales were made to buyers whom they considered regular customers. Many of these firms felt that their long-established reputations in the trade were a major factor in the maintenance of these customers. In addition, a similar situation exists in relation to procurement. Almost all of the first handlers had maintained the same grower accounts for many years, and sales agencies had long sold for the great majority of their first-handler accounts.

Economies of Scale

Bain has suggested that the economies of large-scale plants in an industry may be such that an optimal-size plant would supply a significant share of total industry output.^{1/} Under these conditions, an entering firm would have a significant impact on industry supply with the resulting price effects. Potential entrants are likely to consider such reduced price expectations as a barrier to entry.

Cost studies of the operations in pear, plum, and grape packinghouses all tend to show that most of the economies of scale in these operations are realized at outputs far below any significant percentage of total output of these packed fruits.^{2/} This also appears to be the case even if individual district outputs are considered. In addition, for grapes the use of field packing tends

^{1/} Ibid., pp. 15-16.

^{2/} See references and discussion in the section on marketing efficiency.

to further reduce the importance of scale economies in this sense. There are few indications of substantial advantages of large-scale purchasing which are not available to almost all firms in some manner--for example, through cooperatives or other groups--and there is no evidence of large-scale advertising or sales promotion advantages.

The scale conditions mentioned here assume no great change in technology of handling and shipping these fruits. Should some technical development lead to a change in the types and optimum numbers of facilities required in this industry, the significance of scale economies could be considerably altered.

Summary--Entry Conditions in This Industry

Entry constraints relating to initial investment in facilities do not seem to be significant barriers to most potential entrants. Availability of fruit supplies appears to be a limiting factor in most districts. Grower-shipper control of large volumes in some areas means that little additional fruit is available for nongrower first handlers. Thus, entry into the handling sector may involve a high degree of integration with the producing sector.

Established firms may tend to expand to other districts as location of production changes. However, integration into the industry from above--the wholesale or retail levels--would be expected only if excess profits were available, if cost savings could be achieved by the integrating firm, or if closer coordination of fruit supplies with desired specifications were deemed necessary.

Information obtained in survey interviews indicates that first handlers in most districts compete vigorously for the better growers' fruit, largely on the basis of nonprice factors. Sales agencies strongly compete for desirable first-handler accounts. Generally, interviewed first handlers had capacity for additional tonnage, and sales agencies could easily handle additional accounts; these conditions suggest lack of appeal to potential entrants unless some of the specific factors noted above are of considerable importance.

Extent of Integration

There is little evidence of extensive horizontal integration in this industry. Only about 5 percent of the first handlers responding to the survey packed commodities other than deciduous fruit. Of the independent first handlers for

which information is available, less than 2 percent operated more than one packing and/or shipping facility.

Many firms on the sales agency level operated first-handling facilities in a number of locations. The number of such facilities controlled by a single agency ranged from two to eight. Independent first handlers selling through the same central sales agency are related horizontally in certain respects, such as in supplying fruit for particular orders or utilization of common storage plants or consolidation facilities. Such ties probably aid in obtaining volume discounts in purchasing and may increase bargaining power in selling. Use of a common brand name or label is possible through this type of horizontal arrangement; however, as pointed out in the section on differentiation, district identification is usually maintained rather than utilizing a single label in several districts.

Vertical integration is considered here in terms of the levels through which these fruits are controlled by ownership or some less complete form of integration from the production level forward. Data from first handlers and sales agencies indicate that about 45 percent of the total state tonnage is integrated through ownership with the first-handler level. Of this percentage, 15 percent is further controlled through ownership by firms operating on the sales agency level. Of the remaining 55 percent, 16.5 percent is handled through local cooperative facilities on the basis of membership contracts, and 38.5 percent is either purchased or handled on consignment by commercial packers or grower-shippers. Of the cooperative tonnage, about 12 percent is sold through sales agencies, principally the cooperative marketing association, and the remaining 4.5 percent is sold by the local associations themselves.

Vertical integration through ownership beyond the sales agency level is not widespread in this industry. One agency operates its own office in a terminal market outside the state, and two agencies are divisions of companies which operate brokerage and other receiving facilities as other parts of the parent company. Only one firm interviewed on the sales agency level was involved in fruit processing operations, and, at the time of this study, this was through another division of the company. Interviewed agencies indicated that such instances of forward integration do not provide the firms involved with any distinct operating advantages over other competing firms.

Coordination With the Wholesale and Retail Levels

An aspect of vertical integration that seems to have important implications relates to the degree of coordination between the wholesale and retail levels and firms within this industry.

Although prices are a major factor in differentiating among various product characteristics desired by the market, they are seldom precise enough to allow producers to assess accurately the influence of alternative production practices on their returns. Prices obtained for produced fruit during a given marketing season cannot influence production practices applied to that crop in that year. The long lapse between seasons is likely to reduce the effect of one season's prices on practices carried out in relation to the succeeding year's crop. Hence, more specific guidance than that offered by price alone is needed to bring about production practices better coordinated with market requirements.

Under these conditions, it might be expected that a considerable degree of integration between the wholesale and retail levels and the sellers in this industry would be required. However, survey information indicates almost no formal relationship of this type. The trend to direct buying has not been accompanied by an increase in contractual arrangements among these firms. While the increase in direct buying has put buyers in closer contact with their suppliers in this industry, there is no evidence of increased buyer influence on the specifications of the fruit produced. In general, buyer specifications come to bear only on the selection of fruit with desired characteristics from the produced supply offered by first handlers and sales agencies. Lacking formal integration, such as ownership or contractual ties, the transmission of market requirements to industry members must be accomplished by informal means within the framework of the marketing system. There is some indication that first handlers have adjusted their organizations and operational procedures to meet the requirements of the changing market; however, there is little evidence of the adoption of procedures for assuring desired fruit characteristics at the producer level.

Coordination Among Sales Agencies, First Handlers, and Producers

Several factors apparent in this industry may tend to reduce the extent of marketing coordination among the segments defined. More than 80 percent of total tonnage handled by sales agencies is sold by these firms on an agency

basis for first handlers. The majority of the fruit packed and shipped by first handlers is handled by them on a consignment basis for growers. Hence, maintenance of fruit supplies for these firms is dependent upon continuing grower support, and there is apparently considerable nonprice competition for available fruit supplies among first handlers and sale agencies.

Although some handlers and agencies, through their owned packinghouses, furnish labor crews and other production aids to growers, individual growers generally maintain their independence of action. Many first handlers feel that there is considerable risk for the packing organization in assuming responsibility for production decisions in fruit growing. These fruits are highly susceptible to weather conditions, and certain practices--such as thinning for larger sizes, for example--could lead to drastically reduced returns if heat or rain should further reduce the crop. Assumption of such responsibility by handlers is likely to jeopardize their position with the growers.

There is some indication that premiums available for fruit with the most desired characteristics do not provide sufficient incentive for such fruit to be produced. Some pooling systems may discourage this type of production.^{1/} Some handlers feel that the decline of the auctions has reduced the price spread between the average and the best quality fruit; hence, growers are not compensated adequately for the added costs of higher quality production.

In general, there is little decision-making control over the activities of growers by first handlers or over the activities of first handlers by sales agencies. The interdependence of many of these activities would seem to encourage such centralization of some decision making; however, the apparent grower orientation of California marketing firms and the necessity of maintaining their grower accounts may handicap the effective transmission of buyer requirements and/or increased centralization of control within the industry.

THE IMPACT OF MARKET STRUCTURE AND ORGANIZATION ON PRICE DETERMINATION

In other than perfectly competitive markets, the element of bargaining power must be considered in price determination. In the process of arriving at terms of exchange, both price and nonprice factors, such as services and

^{1/} See Appendix B for discussion of pooling methods used.

other differentiating characteristics, enter into the bargaining situation. Market structure, organization, and practices bear on the utilization of these variables in the pricing process.

Number and Size of Buyers and Sellers

Direct buying by grocery chains and groups is the largest single outlet for these fresh fruits, and the share going to them is apparently increasing. Grocery and combination food stores account for about 84 percent of all fresh fruit sales at the retail level (see Table 36). In 1960 chain stores made 39 percent of total grocery store sales and independents 61 percent; however, 79 percent of the independents were affiliated with buying groups in that year as compared to 46 percent in 1947.^{1/} In 1950 the 20 largest grocery chains accounted for 29.9 percent of total grocery sales. In 1958 the largest 20 firms made 35.6 percent of the total.^{2/} Hence, there has been a noticeable trend to increasing concentration of sales volume among the principal buyers of fresh fruits.

Table 37 shows the percentage of total United States grocery store sales made by the 20 largest retail chains in 1958 and the average percentage of food sales which these firms accounted for in the cities in which they operated in 1957. As can be observed in the table, with the exception of the very largest firms, none of these chains controls any appreciable amount of the total grocery store sales in the United States; however, in specific local markets their shares are as high as 24.6 percent and average 16.3 percent of total sales in these areas.

These data provide an indication of the degree of concentration on the buyers' side of the market for California fresh deciduous fruits. Although Mueller and Garoian concluded on the basis of their research that there is likely to be price leadership by the largest chains in purchasing in the

^{1/} Progressive Grocer, Facts in Grocery Distribution (New York, 1961), p. 20. Chain stores are defined as firms operating 11 or more stores.

^{2/} Willard F. Mueller and Leon Garoian, Changes in the Market Structure of Grocery Retailing, 1940-58, Wisconsin Agricultural Experiment Station Research Report No. 5 (Madison, 1960), p. 35. Note: These authors define chains as firms operating four or more stores.

TABLE 36

Consumer Expenditures for Fresh Fruits Sold in Food Stores
United States, 1955-1960

Year	Retail value of total consumption, all outlets	Amount spent in grocery stores, excluding specialty stores	Grocery store sales as a percentage of retail value of total consumption	Fresh fruit sales as a percentage of total grocery store sales
	million dollars		percent	
1955	2,265.0	1,803.0	80.0	4.9
1956	2,485.4	1,995.9	80.0	5.1
1957	2,640.3	2,210.8	84.0	5.2
1958	2,586.8	2,172.9	84.0	4.8
1959	2,629.0	2,199.0	84.0	4.7
1960	2,747.0	2,311.7	84.0	4.8

Source: "Annual Consumer Expenditure Study," Food Topics, for the years 1955-1957, Vol. XIII, No. 17 (September 8, 1959), p. 64; for the years 1958-1960, Vol. XVI, No. 9 (September, 1961), p. 12.

TABLE 37

Sales of 20 Largest Chains as a Percentage of Total
United States Grocery Store Sales and as a Percentage
of Total Food Sales in Their Operating Areas

Chain	Sales	
	As percentage of total United States grocery store sales, 1958	As percentage of total food sales in operating areas, 1957
Great Atlantic and Pacific	11.4	15.6
Safeway	5.0	22.6
Kroger	4.4	15.7
American	2.0	19.6
National Food	1.8	9.1
Food Fair	1.6	18.1
Winn-Dixie	1.4	22.9
First National	1.2	18.2
Grand Union	1.1	17.4
Colonial	1.0	14.4
Jewel Tea	1.0	24.6 ^{a/}
ACF-Wrigley	.9	12.9
Loblaw	.6	12.7
Stop and Shop	.4	13.7
Penn Fruit	.4	b/
Thriftmart	.4	
Red Owl	.4	11.3 ^{c/}
Bohack	.4	
Lucky	.3	13.3
Weingarten	.3	14.4

a/ Does not include home service routes.

b/ Blanks indicate no data available.

c/ Does not include this firm's wholesale sales.

Source: Willard F. Mueller and Leon Garoian, Changes in the Market
Structure of Grocery Retailing, 1940-58, Wisconsin Agricultural
Experiment Station Research Report 5 (Madison, 1960), p. 8.

national market, their results indicated that, due to the large number of small- and medium-size firms in the grocery industry, the prices established would be close to competitive levels. However, they also concluded that in markets smaller than national (or large regional) it is likely that concentration in buying is great enough to confer potential market power on grocery retailers in their relationships with suppliers, assuming these suppliers have no significant market power themselves.^{1/}

Chain stores and group buyers have been classified as direct buyers in this study. About 48 percent of the tonnage handled by firms surveyed was sold to this type of buyer; however, many first handlers sold a high percentage of their volume to only a few such buyers. The following data show the number of buyers dealt with and the approximate percentage of tonnage sold to these buyers by the 10 first handlers responding to this question.

<u>First handler</u>	<u>Number of direct buyers</u>	<u>Percentage of tonnage sold to these buyers</u>
1	30	90
2	25	25
3	14	38
4	14	37
5	5	15
6	4	50
7	3	75
8	3	75
9	3	65
10	1	25

Discussions with first handlers and sales agency personnel lead to the conclusion that prominent among the direct buyers for these fruits are at least two of the three largest national chains. The largest national chain is generally believed to be a principal factor in the market for these fruits. Many industry members stated that they could be "pretty sure" the prices offered by the one or two largest chains were about "the market" for the particular product.

On the basis of evidence presented in earlier sections of this report, there is little indication of concentrated control of significant volumes of fruit in the California industry. Timing of harvest may give a few firms a higher degree of control over available supplies of specific fruits for a

^{1/} Ibid., p. 23.

limited time, but its extent and duration is probably not sufficient to change the general prevalence of an apparent low degree of seller concentration.

This study revealed no trend to increasing concentration of sellers in the industry. Although there have been a few mergers and acquisitions within the past few years, these do not seem to have changed the overall concentration of sales control within the industry. There are some indications that the volume of tonnage handled by grower-shippers may increase. If more large growers find that they can profitably pack, ship, and sell their own fruit plus varying amounts of neighbors' fruit, concentration of sales control may be further reduced.

Organization and Types of Buyers and Sellers

Direct buyer procurement organizations and buying brokers operating in the production areas of the state are purchasing an increasing share of the total fresh volume of these fruits. As is evident in this industry and in other agricultural industries, fewness of buyers and sellers is more likely to be characteristic of direct buying situations than of central markets.^{1/} The fewer the buyers and sellers the greater are the opportunities for bargaining power to be exerted by either side in the process of price determination. Hence, shifting the locus of the exchange transaction to the production district from the central market is likely to benefit the participant with the stronger market position.

Involved in the bargaining power that is brought to bear on a specific sale is the ability of the seller to hold his fruit off the market. For highly perishable products such as these fruits, this can only be accomplished with cold storage facilities. Survey results reported earlier in this report indicate that about 32 percent of the first handlers in the state operate cold storage plants (capacity of more than 20 carlots), and about 18 percent operate precooling facilities. The balance of these handlers--about 50 percent of the firms--either utilize commercial storage or ship their fruit as soon as

^{1/} For a discussion of this point in relation to direct sales of livestock, see Harold F. Breimyer, "On Price Determination and Aggregate Price Theory," Journal of Farm Economics, Vol. 39, No. 3, Part I, August, 1957, pp. 676-694.

packed. Few firms use commercial storages, and these use them principally for long-storage fruit. Therefore, it appears that about half of the first handlers in the state must either sell their fruit f.o.b. as it is packed or roll it for later sale to private buyers or to buyers in auctions or consignment markets.

Almost all sales of these fruits are on a day-to-day basis. There are few longer term contracts with buyers. Under these conditions, first handlers, especially those without storage space, are highly dependent upon daily sales to move their fruit. The increasing percentage of private sales as compared to auction or consignment sales means that fewer outlets for unsold fruit are open. In addition, the increase in truck shipments--about 18⁴ percent for interviewed firms between 1950 and 1960--means that relatively fewer railcar outlets are available. Trucks are generally loaded for f.o.b. sales. These may not be as readily available as railcars, and they usually require more advance scheduling for loadings. These factors have important bearing on the bargaining capacity of sellers, especially in dealing with field buyers who are well aware of the applicability of each of these factors to a specific seller.

Selling fruit through sales agencies should increase the degree of control over available supplies and thereby tend to increase the bargaining power of the sellers. However, the degree of control over the fruit handled by an agency is dependent upon the nature of the first handler-agency procurement arrangement. In general, these arrangements are informal and often not rigidly enforced in the California industry. Hence, although about half of the tonnage of these fruits is sold through agencies, first handlers often retain a considerable share of authority in agency sales decisions.

The increasing number of field buyers of various types operating in production areas tends to bring more contact between first handlers and sales outlets; hence, decreasing control by sales agencies may be expected. To the extent that the degree of concentration of sales control aids in offsetting the bargaining power of buyers, a tendency to independent selling may further weaken seller position.

Availability of Market Information

Increased purchases of fresh deciduous fruits at shipping point rather than through the terminal auctions have reduced the reliability of the auctions

as factors in price determination. Among the firms responding to the survey, tonnage sold through auctions in 1959 was about two-thirds of the volume sold by these firms through these outlets in 1950. However, this reduced tonnage is not the only change in the nature of auction receipts. The auctions are becoming to an increasing extent distributors of higher priced specialty fruits rather than outlets for volume movement of lower priced items.^{1/} Hence, the fruit sold through auctions is not likely to be representative of the total volume of fruit available for fresh sale.

The changed nature of the auctions has placed increased emphasis on the other sources of market price information. Daily market news reports are published by the Federal-State Market News Service and are readily available to the industry. Although these reports furnish a broad indication of prices and market conditions, problems of obtaining f.o.b. price information and the difficulties of tying prices to widely varying quality specifications tend to reduce their value. As has been discussed in an earlier section, U. S. grades, upon which most market news prices are based, allow considerable variation within each grade. This characteristic often reduces their value as a basis for price differentiation.

Major sources of market information in this industry are sales agencies, brokers, and field buyers. Information spreads rapidly within districts, and the purveyor of misinformation is usually easily discovered. Most of this price and quality information is related to specific labels rather than general grades, and, since these labels are widely known, it is likely to give a fairly accurate picture of relative prices for different qualities of fruit.

Although there is a great deal of market information generated by market news services, marketing order administrative organizations, and marketing agencies, the wide variations among quality characteristics noted may lead to a smaller amount of usable information than is suggested by its apparent availability. Differences in interpretation of observed characteristics by sellers and buyer representatives may cause serious problems of information exchange.

Summary--Structure and Organization in Relation to Price Determination

The current structure of the market for California fresh deciduous fruits is characterized by an increasing volume of tonnage moving to fewer and larger

^{1/} Manchester, op. cit., p. 15.

sales outlets. This apparent trend toward concentration among buyers is not matched by such a trend among sellers in the California industry. Sales control is largely diffused among a great many individual firms. Even in those cases where a relatively large share of tonnage is handled by a few sales agencies, such as is the case for pears, effective marketing control is reduced due to the generally informal nature of sales arrangements among growers, first handlers, and sales agencies.

Many of the smaller volume handlers selling their own fruit are heavily dependent upon a few sales outlets purchasing through field buyers or buying brokers operating in production districts. Lacking storage facilities, some handlers must make immediate sales of fruit during peak periods. Reduction in outlets for unsold fruit, such as auctions, means that private sales markets may become more easily saturated, especially if a large portion of such buying takes place in the production district.

The process of price discovery has been made more difficult by the decline in volume moving through auctions and the fact that the remaining auction volume is not representative of the total supply of fruit available. The increasing volume of tonnage sold at shipping points to buyers or their representatives in production districts may reduce the influence of buyers not so represented and thereby lessen seller awareness of the total market and decrease the possibility of attaining optimum distribution patterns.

As a result of the circumstances enumerated here, it seems apparent that the structure and organization of this industry and its markets do little to enhance seller market power. To the extent that prices and other terms of exchange are affected by the bargaining power of the buyers and sellers of these fruits, it appears likely that the California industry has been relatively disadvantaged by the recent changes and current trends in the marketing of these fruits.

MARKETING EFFICIENCY IN THIS INDUSTRY

Reduction of marketing costs and improvement in the coordination of consumer desires and the decisions of producers and marketing firms are major factors in increasing marketing efficiency. Among the important sources of cost saving in the California fresh deciduous fruit industry are those involving the realization of a greater share of available economies of large-scale

production and the attainment of a higher degree of plant and equipment utilization. Coordination of interrelated activities is another major source of greater efficiency and involves reducing duplication of functions, effectively meeting the requirements of adjacent levels of the distribution system, and efficiently transmitting detailed specifications from sales to production levels.

Scale of Operations

A long-run average cost curve, or planning curve, may be drawn as an "envelope" to a series of short-run cost curves of a number of plants operating under theoretically optimum conditions in an industry at a given time. By comparing the cost-volume relationships of existing plants to the planning curve, it is possible to estimate the extent to which plants in the industry are achieving available economies of scale.

Previous studies by the California Agricultural Experiment Station have developed cost curves for plants handling fresh pears, plums, and table grapes.^{1/} These cost curves were developed through use of the engineering-economic approach, which utilizes engineering studies of plant operations, accounting records, and information from equipment manufacturers to obtain detailed cost data. On the basis of plant studies, input and cost relations for the various segments of plant operation were developed, efficient techniques for each segment were selected, and the cost relationships for separate operations were synthesized into aggregate cost relationships for the entire plant.

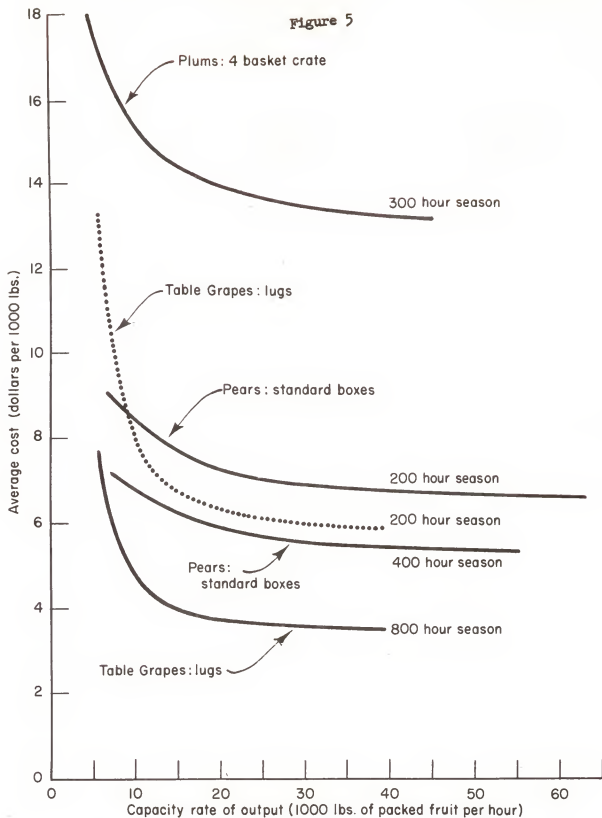
Average cost curves based on the relationships so derived are presented in Figure 5. The conditions assumed in the generation of these curves approximate those prevailing in many of the existing packinghouses. Although variations

^{1/} These cost curves appear in the following:

B. C. French, L. L. Sammet, and R. G. Bressler, "Economic Efficiency in Plant Operations with Special Reference to the Marketing of California Pears," Hilgardia, Vol. 24, No. 19, July, 1956, pp. 543-721.

D. G. Stallings and L. L. Sammet, Plum Packing Costs and Efficiency: The Effects of Packing Methods and Type of Container, University of California, Giannini Foundation Mimeographed Report No. 225 (Berkeley, 1959), 98p.

Sammet, op. cit.



Average Costs of Packing Fresh Plums, Pears, and Grapes in Relation to Hours of Operation Per Season, Under Assumed Conditions^{1/}

(Continued on next page.)

Figure 5 continued.

1/ Assumed conditions:

Plums--1955 factor prices, 20 percent cull rate, cost of container materials not included.

Pears--1950 factor prices, 70 percent of total plant output packed (balance to cannery or culls), cost of packing materials not included.

Table grapes--1953 factor prices, 30 percent cull rate, packer output rate of 10 lugs per hour, cost of packer labor, packing materials, and car bracing materials not included.

Data not adjusted for differences in factor costs in different years.

Sources:

Plums--D. B. Stallings and L. L. Sammet, Plum Packing Costs and Efficiency: The Effects of Packing Methods and Type of Container, University of California, Giannini Foundation Mimeographed Report No. 225 (Berkeley, 1959), p. 82.

Pears--B. C. French, L. L. Sammet, and R. G. Bressler, "Economic Efficiency in Plant Operations with Special Reference to the Marketing of California Pears," Hilgardia, Vol. XXIV, No. 19, July, 1956, p. 690.

Grapes--L. L. Sammet, "Economic and Engineering Factors in Agricultural Processing Plant Design" (unpublished Ph.D. dissertation, Department of Agricultural Economics, University of California, 1958), p. 396.

from these assumed conditions would no doubt shift the level of these curves, they probably would have little significant effect on the shape of the curves, which is the major factor in relation to achievement of scale economies.

The shape of the curves in Figure 5 indicates the importance of size of plant, as measured by capacity rate of output, to average costs. It is apparent that most of the economies of scale are achieved in a pear packing house with a capacity rate of output of about 25,000 pounds of packed fruit per hour. In grape packinghouses, a rate of 15,000 pounds per hour achieves a large share of these economies. For plums, the rate of average cost decline is substantial until output rate reaches about 30,000 pounds per hour; however, the decline starts to lessen considerably at output rates of between 15,000 and 20,000 pounds per hour.

Table 38 summarizes capacity rates of output of packed fruit in various containers for first handlers responding to the survey. These data indicate that the average capacity rate of output for pears in standard boxes is 27,600 pounds of packed fruit per hour. For table grapes in lugs, this rate is 16,100 pounds, and for plums in four-basket crates it is 10,600 pounds. Relating these rates to the curves in Figure 5, it is apparent that the average pear or grape packinghouse has a capacity output rate great enough to achieve most of the available scale economies. However, plum packinghouses, on the average, have rates of output considerably below those needed to achieve this situation.

Although the average pear or grape packinghouse gains most of the possible economies of scale, it can be observed in Table 39 that about 60 percent of the pear houses have output rates of less than 25,000 pounds per hour and 60 percent of the grape plants have rates of less than 15,000 pounds per hour. Hence, unit costs could be reduced considerably in both of these cases if plants had higher capacity output rates. This table indicates that as high as 90 percent of the plum packing operations have capacity output rates of less than 15,000 pounds per hour, and almost 55 percent of these plants have rates of less than 10,000 pounds. These rates are much below optimum scale as shown in the study cited.

If the relationship of existing capacity rates of output in the pear, grape, and plum packing plants considered above can be taken as indicative of the situation in the packing of the other major fresh deciduous fruits, it is apparent that many of the packing facilities in this industry are operating well below optimum rates of output. Of course, it must be recognized that in

TABLE 38

Capacity Rates of Output of Packed Fresh Deciduous Fruits in Various Containers
California Packinghouses, 1960

Fruit and container	Number of firms responding	Net weight of fruit per container	Capacity hourly output rates for packed fruits ^{a/}				
			Average		Median		
			thousand pounds	boxes	thousand pounds	boxes	thousand pounds
Apples		pounds	boxes	thousand pounds	boxes	thousand pounds	thousand pounds
Standard box	6	44	354	15.6	450	19.8	4.4-44.0
Apricots							
L. A. lug	2	26	300	7.8	300	7.8	7.8- 7.8
Brentwood lug	3	25	486	12.1	600	15.0	6.5-15.0
Cherries							
Campbell lug	6	15	147	2.2	162	2.4	.9- 3.0
Calex lug	10	18	158	2.8	162	2.9	.6- 5.4
Table grapes							
Grape lug	62	28	574	16.1	500	14.0	2.8-67.2
Juice grapes							
Grape lug	13	32	736	23.6	800	25.6	8.0-38.4
Nectarines							
Peach box	30	18	462	8.3	400	7.2	1.1-18.0
L. A. lug	13	23	831	19.1	800	18.4	5.7-34.5
Peaches							
Peach box	28	18	947	17.0	1,000	18.0	4.5-36.0
L. A. lug	43	23	520	12.0	400	9.2	2.3-34.5
Pears							
Standard box	28	48	574	27.6	444	21.3	5.3-96.0
L. A. lug	14	24	826	19.8	800	19.2	7.2-36.0
Plums							
4-basket crate	42	28	379	10.6	350	9.8	2.8-28.0
L. A. lug	12	24	440	10.6	262	6.3	1.9-24.0
Carton	3	24	133	3.2	100	2.4	1.4- 6.0

^{a/} Rates apply to usual method used by plant to achieve capacity output for each container. In some plants, all equipment can be used to pack various containers, while in others, none or only part of packing equipment is adaptable in this manner.

Source: Mail and interview surveys.

TABLE 39

Capacity Hourly Rate of Output of Packed Fruit by a Percentage of Plants Indicating Specified Rates
California, 1960

Capacity hourly rate of output thousand pounds	Type of fruit and container					
	Pears (standard boxes)		Table grapes (grape lugs)		Plums (4-basket crates)	
	Each rate category	Cumulative	Each rate category	Cumulative	Each rate category	Cumulative
	percentage of total number of plants packing fruit indicated					
1.0- 4.9	3.6	3.6	4.8	4.8	14.3	14.3
5.0- 9.9	7.1	10.7	24.3	29.1	40.4	54.7
10.0-14.9	28.6	39.3	30.6	59.7	35.7	90.4
15.0-19.9	7.1	46.4	24.3	84.0	2.4	92.8
20.0-24.9	14.3	60.7	4.8	88.8	4.8	97.6
25.0-29.9	10.7	71.4	3.2	92.0	2.4	100.0
30.0-34.9	7.1	78.5	1.6	93.6		
35.0-39.9	3.6	82.1	1.6	95.2		
40.0-44.9	3.6	85.7	3.2	98.4		
45.0-49.9	3.6	89.3	0	98.4		
50.0 and over	10.7	100.0	1.6	100.0		

a/ Net weights per container as follows: standard pear box, 48 pounds; grape lug, 28 pounds; 4-basket plum crate, 28 pounds.

Source: Mail and interview surveys.

plants with multiple-product operations--plants packing two or more fruits--the effective scale of output is likely to be greater than when judged in terms of a single product. For example, if hourly output of certain pieces of equipment, or certain personnel, is raised by packing several types of fruit simultaneously, additional economies of scale should be realized. However, if peaches and nectarines, for example, are packed alternatively during the season, there should be little variation in capacity output rates except that associated with specific fruit characteristics.^{1/} On the other hand, a wider distribution of overhead costs through longer season operation in a multiproduct plant may yield cost advantages to a plant of smaller scale than the optimum when measured in terms of a single-product output. In addition, assembly costs for the raw product should be considered in determining optimum scale of operations, since costs of expanding the supply area must be weighed against the savings from scale economies achieved in the plant.

Variations in length of season and proportion of culls also have a significant bearing on the level of unit costs in the packing of these fruits; however, the shape of the curves is generally little changed, and therefore the relationships to optimum scale should apply over wide ranges in the magnitudes of these additional variables. Thus, on the basis of the output rate data for the three fruits considered, it appears that from 30 to 50 percent of the existing packing plants may not be realizing a large share of the possible economies of larger scale operation. From 45 to 90 percent of the plants have capacity rates of output below which a substantial portion of these scale economies could be realized. Data from the survey indicate that about 31 percent of the fresh pears and almost 80 percent of the plums are packed in plants having less than optimum rates of output.

Utilization of Facilities

Length of operating season is a principal factor in the determination of average unit costs associated with the packing of these fruits. In a highly

^{1/} The nature of multiple-product packing in California plants is considered in the succeeding section in relation to the scale of the firm as opposed to the plant.

seasonal industry such as this, fixed and overhead costs are spread over a volume produced during a relatively short period of operation. Several factors bear on the length of this annual season for a given plant. These include the type of fruit, its physical characteristics and location of production, the total tonnage handled, and the volume of fruit available in the area supplying fruit to the facility. In addition, the season may be extended through a multiple-product operation if the various fruits are distributed over time.

Timing and Length of Annual Operating Season

The first fresh deciduous fruit shipping operations in California each season are generally in the Lodi district, with early cherries starting about May 1. Harvesting moves through various other districts during the following seven months, the final fresh harvesting taking place in the Delano district with Emperor grapes in the latter part of November. Table 40 shows the approximate timing and length of season in each district and the peak period or periods for tree fruits and grapes.

The average length of annual operating season for first handlers responding to the surveys was 79 days.^{1/} The average number of days operated by handlers in each district is shown in Table 40. This table also shows the ratio of the number of days operated by packinghouses in each of the districts to the approximate total number of days in the season. This ratio varies widely among districts due to slack periods between varieties and during active harvesting periods. Although this is a very rough measure of the utilization of facilities within the season, it emphasizes the fact that not only is facilities use limited to a relatively short total harvest season but in many cases a plant is utilized for only a small percentage of that season.

Utilization of Cold Storage Facilities

Cold storage facilities operated by first handlers are subject to the same type of seasonal utilization as packinghouses.^{2/} Storage plants operated

^{1/} Includes plants packing deciduous fruits only.

^{2/} Some firms extend storage utilization by operating as commercial storage plants during their off season; however, this practice is usually limited to use by canners for relatively short periods.

TABLE 40

Typical Length of Packing Season of Tree Fruit and Grapes by First-Handling Firms, by District, California

District	Tree fruit			Grapes			Total days in season ^{b/}	Average days of operation per season	Ratio of days operated to total in season
	Start	Peak ^{a/}	Finish	Start	Peak ^{a/}	Finish			
1. Coachella				4/23	6/23	7/10	77	39	50.6
3. Bakersfield	5/7	6/1	6/8	7/1	7/20	8/3	64	49	76.6
4. Delano				7/20	9/1-10/25	11/25	125	116	92.8
5. Exeter-Visalia	5/25	Various	9/20	9/25	10/25	11/15	170	81	47.6
6. Fresno-Dinuba	6/1	8/10	8/20	8/15	8/25-11/1	11/15	165	118	71.5
7. Modesto	6/20	6/30-8/5	8/12				52 ^{c/}	59	
8. Lodi	5/1	5/30	8/20	9/1	9/20	10/25	165	68	41.2
9. Sacramento River	7/6	7/12	8/1				24	20	83.3
10. Placerville-Placer County	6/5	7/25-8/20	10/25				140	54	38.6
11. Winters-Brentwood	6/15	Various	8/15				60	18	30.0
12. Sebastopol	7/15	8/1	9/20				65	47	72.3
13. Lake-Mendocino	8/4	8/25	9/7				33	31	93.9
15. Santa Clara-San Benito ^{d/}	5/20 8/15	6/10 8/20	6/20 10/10				85	41	^{e/}
16. Watsonville	9/1	Constant	11/20				80	115 ^{f/}	

^{a/} Two peak periods indicated for some districts due to distinct peaks for different types or varieties of fruit.^{b/} Thirty-day months.^{c/} Data available for tree fruit only; some juice grape operations included in "average days" data.^{d/} Two sets of data required due to split seasons for cherries and pears from this district.^{e/} Not applicable due to split seasons and different firms handling the two major commodities.^{f/} Fruit largely packed out of storage, hence, operating days not related to harvest period.

Sources: Dates of seasons by firms interviewed; days of operations by mail and interview surveys.

by firms responding to the survey are utilized less than 50 percent of capacity for an average of 7.9 months of a typical year and less than 25 percent of capacity for an average of 6.4 months.

District variation in utilization of storage facilities is directly related to the types and varieties of fruit produced. For example, in the late grape districts, such as Delano and Exeter-Visalia, storage facilities are utilized at less than 50 percent of capacity approximately seven months and less than 25 percent only four months of the year. However, in the Bartlett pear districts, such as Placerville-Placer County and Lake-Mendocino, these facilities are utilized at less than 50 percent of capacity for 10-11 months of the year and less than 25 percent of capacity for 8-10 months.

Composition of Total Pack--First Handlers

Table 41 shows the types of fruit making up the total tonnage of first handlers of each type considered in this study. These data give an indication of the so-called "product mix" of these firms. For example, the total volume of first handlers of table grapes is made up as follows: 68.6 percent table grapes, 9.1 percent peaches, 9.0 percent juice grapes, 8.6 percent plums, 3.8 percent nectarines, .4 percent cherries, .2 percent apricots, and .1 percent pears. The table also indicates that, in general, the bulk of the volume of plants handling cherries, nectarines, peaches, and plums is made up of fruits other than these. Apple, pear, and grape handlers are more specialized, with relatively little of their volume made up of other fruits.

An approximation of the extent of multiple-product handling in the various districts is given in Table 42, which shows the number of types of fruit that are packed and/or shipped by first handlers in each district and the percentage of the firms handling various numbers of products. In many cases this pattern reflects the specialization of production in the areas considered. As can be observed in the table, handlers in the Coachella, Delano, Sacramento River, Sebastopol, and Lake-Mendocino districts are highly specialized, with between 89 and 100 percent of them handling only one product. However, in the Fresno-Dinuba district, almost 75 percent of the plants pack more than a single type of fruit, and about 53 percent of them handle four or more fruits. Totals indicate that about 55 percent of the state's packers and shippers handle a single product. Of the remaining firms, 12.2 percent handle two of these fruits; 12.2 percent, three fruits; 18.9 percent, four fruits; and 1.7 percent, five of these fruits.

TABLE 41

Percentage of First-Handling Firms Handling Each Type of Fruit and the Composition of Their Total Pack
California, 1959

Fruit	Firms handling as a per- centage of total responding	Types of fruit handled								
		Apples	Apricots	Cherries	Table grapes	Juice grapes	Nectar- ines	Peaches	Pears	Plums
		percentage of total tonnage								
Apples	6.7	52.3	0	0	3.8	0	3.5	1.9	33.4	5.0
Apricots	2.9	0	28.9	4.2	22.5	22.6	2.8	4.3	7.5	7.2
Cherries	8.8	0	5.6	12.7	55.0	9.8	.4	1.3	11.9	3.3
Table grapes	58.8	0	.2	.4	68.6	9.0	3.8	9.1	.1	8.6
Juice grapes	20.6	0	.5	1.0	55.6	24.9	4.1	7.3	.3	6.4
Nectarines	31.9	.6	.8	.2	37.9	9.6	10.2	20.2	6.6	13.9
Peaches	34.5	.6	.1	0	34.7	8.6	9.5	21.8	9.5	15.2
Pears	18.1	1.1	1.5	.5	3.4	3.5	3.2	1.6	69.6	15.6
Plums	36.6	.8	.6	.5	42.8	7.2	6.8	14.2	9.3	17.7

Source: Mail and interview surveys.

TABLE 42

Number of Types of Fruit Handled by California First-Handling Firms, by District, 1959

District	Number of types of fruit handled				
	One	Two	Three	Four	Five
	percentage of total firms handling				
1. Coachella	100.0	0	0	0	0
3. Bakersfield	45.4	27.3	9.1	18.2	0
4. Delano	94.4	0	5.6	0	0
5. Exeter-Visalia	50.0	15.6	12.5	21.9	0
6. Fresno-Dinuba	26.6	7.8	12.5	51.6	1.5
7. Modesto	45.4	27.3	27.3	0	0
8. Lodi	60.0	4.0	24.0	8.0	4.0
9. Sacramento River	100.0	0	0	0	0
10. Placerville-Placer County	8.3	41.7	41.7	0	8.3
11. Winters-Brentwood	50.0	16.7	0	16.7	16.6
12. Sebastopol	100.0	0	0	0	0
13. Lake-Mendocino	88.9	11.1	0	0	0
14. Northern California	57.1	28.6	14.3	0	0
15. Santa Clara-San Benito	83.3	16.7	0	0	0
16. Watsonville	85.7	14.3	0	0	0
Total	55.0	12.2	12.2	18.9	1.7

Source: Mail and interview surveys.

Size of Supply Area for First Handlers

Among the factors that determine the size of the area from which supplies of fruit can be feasibly assembled for handling are costs of transportation, bruising involved, and necessity of removing field heat. Bruising is considered the most limiting factor for peaches, plums, and nectarines, while heat removal is a major problem in hauling grapes long distances for packing, particularly during the hot summer months.

Most of the handlers interviewed felt that bruising problems could be largely overcome if fruit were harvested at the proper maturity stage and if the right type of containers and truck were used. In the pear and apple districts, particularly those in the foothill and mountain areas, improvement in road conditions and hauling equipment would overcome many of the bruising problems of hauling to the packinghouse.

Among the handlers interviewed, the average length of haul from orchard or vineyard to packinghouse was approximately 5.6 miles, and the maximum distance hauled by these firms averaged 12.6 miles. In some districts, where grower-shippers' packinghouses are located next to their growing operations, the average length of haul is less than a mile. The maximum length of haul reported was 28.4 miles, although some packers had hauled fruit as much as 50 miles for packing in past years. Table 43 shows the average and maximum length of haul of firms interviewed in each district.

A factor that usually increases the length of haul from producer location to the packing facility is grower preference for a particular packer other than the closest one. This preference may be based on personal relationships, variations in operating procedures, availability of financing, ethnic ties, or desire to belong to a cooperative. First handlers may avoid fruit from certain nearby growers for the same reasons plus quality considerations or other factors of importance to the firms. In a few relatively isolated districts, the closest facilities may not have capacity available to handle additional tonnage; however, this situation was apparent in only two of the districts considered in this study.

The Relationship of Facilities Utilization to Operating Costs

The data presented in Figure 5 give an indication of the relationship of length of seasonal operations to packinghouse costs. Two estimated long-run

TABLE 43

Length of Haul from Orchard or Vineyard to Packinghouses
California First-Handling Firms, by District

District	Length of haul	
	Average	Maximum
	miles	
1. Coachella	4.7	15.3
3. Bakersfield	14.0	22.0
4. Delano	5.0	9.0
5. Exeter-Visalia	5.7	14.0
6. Fresno-Dinuba	7.6	28.4
7. Modesto	12.0	15.0
8. Lodi	3.5	7.5
9. Sacramento River	8.0	16.0
10. Placerville-Placer County	5.3	10.7
11. Winters-Brentwood	.5	1.0
12. Sebastopol	3.0	6.0
13. Lake-Mendocino	5.0	20.0
15. Santa Clara-San Benito	4.0	6.0
16. Watsonville	.5	1.0

Source: Interviews with first handlers.

average total cost curves based on different total hours of operation per season for pear and grape packinghouses are shown. Although the cost data for these curves were obtained mainly in the early 1950's, the underlying relationships have probably remained about the same, even though price levels of production factors have risen considerably.

As shown in the figure, at a capacity rate of output of 25,000 pounds of packed pears per hour, average total costs per 1,000 pounds would be about \$7.00 for a 200-hour season.^{1/} However, if the season were extended to 400 hours of operation, all else remaining the same, the appropriate curve indicates that total cost per 1,000 pounds would be only \$5.70, a reduction of approximately 17 percent. This saving largely reflects the spreading of fixed and overhead costs over the larger output of the longer period. Average variable costs are little affected by the length of season.

A similar situation exists in grape packing. Using the same procedure as above, the data in Figure 5 indicate a cost saving of about 41 percent if hours of annual operation are extended from 200 to 800. Although comparable studies for other types of fruit are not available, it can be assumed that similar relationships would be found.

Cold storage plants and other facilities involving fixed costs are subject to the same types of reductions in unit costs through greater utilization. The principal difficulty in achieving such utilization is the high degree of concentration in timing of harvest of products in most districts.

Utilization of New Techniques

The extent of industry utilization of three relatively recently developed methods of handling these fresh fruits--prepackaging in consumer-size units, bulk filling of containers, and use of bulk bins--was discussed in a previous section. These techniques are related to the efficiency with which these fruits are marketed.

A recent study of prepackaging California table grapes at shipping point concluded that such packing for shipment to distant markets was "commercially

- - - - -

^{1/} These cost data do not include packing materials.

feasible."^{1/} This study indicated that transit damage was likely to be less for prepackaged grapes as compared to those shipped in the conventional pack. Packing costs--materials plus labor--for the prepackaged units plus the master container would be considerably higher per pound than if fruit were packed in the conventional lug. However, the authors felt that the buyer demand for prepackaged grapes at retail and the reduced costs of providing these in this manner as compared to repacking from conventional packs should lead buyers to pay shipping point prices high enough to adequately cover costs involved.

There are many unanswered questions relating to costs and methods of handling prepackaged units. In addition, a principal problem revealed by interviews with first handlers and sales agencies in the course of the present study was the lack of advance buyer commitment at prices which would justify the investment in inventory of materials, added packing equipment, and packing expense. Also, questions as to the influence of prepackaged products in expanding consumer demand and increasing grower net returns have not yet been answered. Hence, it would appear that there are a number of reasons why prepackaging has not been more readily adopted by this industry.

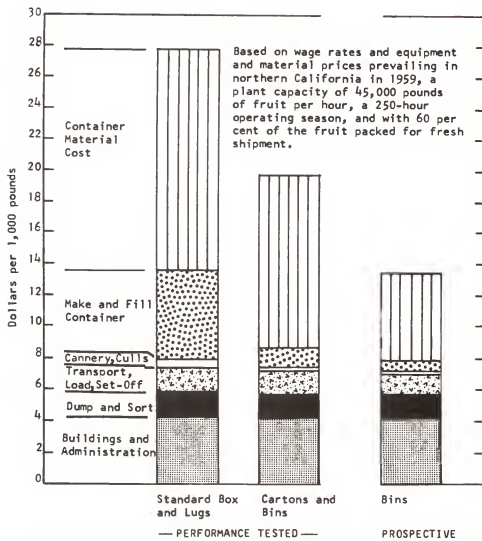
Another recent research study compares the costs of packing Bartlett pears in standard boxes, bulk-filled cartons, and bulk bins for fresh shipment.^{2/} These packing methods are related to specific assembly methods, and the estimated relative costs of various combinations of assembly procedures and packing containers are shown in Figure 6. For example, it can be seen that by utilizing bins for the orchard-to-plant haul and bulk-filled cartons for shipping at the time of the study and under the stated conditions, costs estimated were about \$8.00 per 1,000 pounds of fruit less than the traditional procedure using lugs and standard boxes. It was estimated that utilization of bins for hauling and shipping would reduce costs by almost \$12 per 1,000 pounds as compared to traditional procedures.^{3/}

^{1/} Philip W. Hale and Donald R. Stokes, Prepackaging California Grapes at Shipping Point, U. S. Department of Agriculture Marketing Research Report No. 410, 1960, p. 35.

^{2/} John F. Stollsteimer and L. L. Sammet, "Packing Fresh Pears," California Agriculture, Vol. 15, No. 10, October, 1961, pp. 2-4.

^{3/} Based on 1959 costs.

Figure 6



Packing and Container Material Costs in Relation to Type
Of Assembly, Shipping, and Cannery Container,
California Fresh Pears, 1959.

Source: John F. Stollsteimer and L. L. Sammet, "Packing Fresh Pears,"
California Agriculture, Vol. 15, No. 10, October, 1961, p. 2.

In Figure 7, the average cost of hauling and packing pears in two types of container combinations is shown. Although the shapes of the cost curves are approximately the same for the two procedures--lugs and standard boxes versus bins and cartons--the level of cost per 1,000 pounds varies considerably. A similar situation is found in Figure 8, which shows the average unit costs of handling plums in four-basket crates in comparison to bulk-filled cartons.

As is evident from the estimated average unit cost data developed in these various studies, there are apparently considerable savings to be made through the use of certain types of new containers and techniques. However, none of these cost studies specifically consider the effects of shifts to new containers on market prices, and such shifts cannot be expected to take place without evidence of favorable market acceptance.

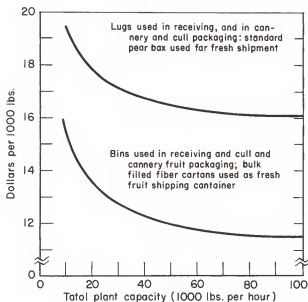
Barriers to the Adoption of Technical Changes

The relatively recent experience of many of the firms interviewed in the course of this study with a newly developed, bulk-filled plum container provides a case study of several of the problems involved in the adoption of technical changes. These firms--sales agencies and first handlers--invested considerable time and money in experimenting with and actually packing and marketing this new container. The results of this attempt were largely disappointing to all of the organizations that participated. Customers who showed great interest during the early stages of the use of these containers failed to reorder them, and, although one large, integrated California firm has continued to use this container in limited quantities, little revival of buyer interest has been achieved. This situation and other similar cases lead to several generalizations that are believed to be significant to the adoption of these types of change.

Technical changes in fresh deciduous fruit handling can be subdivided into two broad categories: (1) those that obviously alter the nature of the final product, such as bulk filling or use of fiber containers in place of wood and (2) those that affect internal firm operations but are not reflected to any great extent in the final product, such as orchard-to-plant hauling in bulk bins or automatic dumping in the packinghouse.

California deciduous fruit packers, generally, have been quick to adopt many improvements of the second type in order to achieve cost savings. However, these firms have been reluctant to adopt changes of the first type,

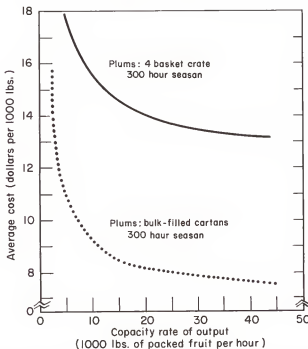
Figure 7



Packinghouse Cost in Packing Fresh Pears in Relation to Plant Capacity and Packing Container, California, 1959

Source: John F. Stollsteimer and L. L. Sammet, "Packing Fresh Pears," California Agriculture, Vol. 15, No. 10, October, 1961, p. 4.

Figure 8



Average Costs of Packing Fresh Plums in Relation to Method of Packing Assuming 20 Percent Cull Rate and 1955 Price Levels.^{1/}

^{1/} Cost of container materials not included.

Source: D. G. Stallings and L. L. Sammet, Plum Packing Costs and Efficiency: The Effects of Packing Methods and Type of Container, University of California, Giannini Foundation Mimeographed Report No. 225 (Berkeley, 1959), p. 62.

particularly if these involve substantial change from traditional procedures. Discussions with firm managers indicate that most firms are willing to make significant changes affecting the form of the packed product if there are evident benefits and if all, or at least a large majority, of the other firms in the industry would make the same change at the same time. However, experience with such moves in the past by individual packers, or even by a substantial minority, has led to extreme caution in this respect. A principal factor in this problem is the highly decentralized structure of this industry, with no single first handler or sales organization controlling a significant portion of the pack of any fruit.

Most of the larger sales agencies indicate willingness to promote changes of this type only if their customers demand them and are willing to back up their demand with assurance of continual acceptance. Many first-handling firms interviewed have avowed policies of not pioneering any new innovations that would affect the final product to any great degree. These firms feel that they cannot afford to risk the financial loss or the loss of grower accounts that has often resulted from the discounting of market prices of new types of packs or containers, particularly if heavy investment in materials and equipment has been necessitated. Similarly, sales agencies are reluctant to risk loss of first-handler accounts by recommending adoption of techniques that may result in lowered gross returns unless savings achieved will clearly increase net profits.

Marketing Coordination

Efficiency in the marketing of these fruits includes effective coordination of market requirements with the activities of producers and handlers. Such efficiency involves the methods by which these requirements are transmitted to the producer level and the degree to which interrelated activities on adjacent levels of the marketing system are coordinated. For example, in respect to this latter problem, if producer decisions do not take into consideration the effects of the physical attributes of fruit delivered to first handlers on the costs of sorting, grading, and packing, unit production costs of usable fruit may be significantly increased. Changes in types and sizes of containers, methods of packing, and the nature of handling facilities by firms on any level have cost implications for firms on other levels.

Coordination between this industry and levels toward the consumer and the nature of intraindustry integration have been discussed in the earlier section on the extent of integration. As indicated there, and on the basis of other information developed in the course of this study, it seems that there are a number of elements in the structure and organization of this industry tending to reduce the degree of coordination among these various levels of the marketing system for these fruits.

Although there apparently is adequate communication between the retail-wholesale level and the sellers in this industry, there seems to be little direction of producer activities by selling firms, either agencies or handlers. First handlers indicate interest in tailoring their product to the desires of the market; however, since the necessary actions are interrelated with producer activities, there must be some type of effective coordination of producer-first handler operations. Without this, attempts to meet the specifications demanded result in high culling rates, loss of output volume, higher costs per unit, and the deterioration of grower-handler relations.

Vertical integration is evident only to a very limited degree in this industry. It is largely confined to the grower-shippers, who produce much of the fruit they pack and, in many cases, also handle sales. There is also integration through various types of contracts. However, neither the contractual relationships existing between the cooperatives and their members nor commercial handlers and their growers exhibit the fundamental requisite for coordination of interrelated activities--centralized control over production operations.

Summary--Structure and Organization in Relation to Marketing Efficiency

Evidence presented in this section indicates that many handlers in this industry are operating under less than optimum conditions. Capacity rates of output far below optimum exist in as many as 30-50 percent of the plants handling fruits for which cost standards are available. Packing seasons as short as 20 days and cold storage facilities that are used at less than 50 percent of capacity as many as 10 and 11 months of the year would seem to be indicative of considerably underutilized facilities. Problems of market acceptance and the weight of tradition seem to preclude the adoption of certain new cost-saving techniques.

It must be recognized that seasonality of harvest and a high degree of production specialization in some districts lead to many of the problems of underutilization and less-than-optimum scale of operation noted. However, it would appear that some plant consolidation with careful attention to the nature of the product mix and the timing of harvest would reduce idle capacity and allow higher capacity rates of output. Some characteristics of the current structure and organization of the industry may provide barriers to such developments.

The predominance of independent grower-shippers, commercial packers, and local cooperative associations at the first-handler level is readily apparent from the data presented in this study. There are few cases of common control of handling facilities in contiguous production areas by the same firms. However, even where this is the case, the emphasis on maintaining good grower relations and the reluctance to abandon traditional procedures may effectively preclude consolidation of these facilities.

In most producing districts, a relatively large number of first handlers compete for the fruit supplies available. Such a situation, according to competitive theory, should tend to bring about operating efficiency among the competing firms. Survey evidence indicates that handlers do, in fact, adopt many internal operational improvements readily. However, the general decentralization of the industry tends to reduce the impetus to adopt changes which affect the characteristics of the product offered for sale. Many firms indicate that only if the entire industry were to shift to a new container--for example, such as occurred in the California citrus industry--would they feel that they could afford to make such a change. The nature of the organization of this industry does not provide the degree of centralization that is likely to bring this about.

The average unit costs of operation of first handlers and sales agencies in the fresh segment of the deciduous fruit industry are clearly affected by the volume of fruit that is shipped fresh. This volume is not only dependent upon crop conditions from year to year but, also, the share of some fruits going to processors and the share which must be culled out due to various quality and size regulations instituted under marketing orders.

A large share of many of these fruits goes to canners, vintners, or raisin processors. Hence, handlers and sales agencies are often dependent on residual supplies from these outlets, and the volume of these residuals varies according to price and other conditions which vary from year to year. However, there is

little evidence of coordination between fresh marketing firms and processors of deciduous fruits. Of course, allocation between these two types of outlets is generally achieved by relative prices; however, prices do not reflect many of the important variations in product characteristics which may be crucial to the optimum allocation of these fruits. In fact, production practices required long before such relative prices are known are likely to be considerably different for fruit moving to fresh as opposed to processing outlets if resource use is to be most efficient.^{1/}

The nature of marketing orders affecting this industry was discussed in an earlier section. An aim of these orders is to raise quality of products marketed and keep so-called undesirable small sizes off the market. However, it is apparent that these restrictions reduce the proportion of marketable fruit to the total supplies moving to fresh handlers. This is especially true if there is lack of coordination between handlers and producers in respect to production of fruit with required characteristics.

Reduction in fresh volume through allocation to processing and marketing order restrictions is likely to raise unit costs of handling and selling. Thus, the competitive position of the fresh marketing segment may be adversely affected as compared to processing alternatives, at least in the short run.

Many of the industry characteristics which have been discussed may help to explain the importance of grower-shippers. This type of firm, handling principally its own fruit, is in a position to meet the requirements for coordinated action between production and sales-oriented activities. The size of the operation required to achieve most of the scale economies may not be so large as to require volumes in excess of those available to many grower-shippers, especially in view of the multiple products handled. Such firms do not have to be as greatly concerned with grower relations in the process of experimenting and instituting newly developed techniques as do most cooperatives and commercial packing organizations. In addition, these firms probably suffer least from shifts in supplies to alternative outlets or from reduction in volumes packed due to grade and size regulations, since they can allocate supplies

^{1/} For a more complete discussion of this problem, see Norman R. Collins, "Changing Role of Price in Agricultural Marketing," *Journal of Farm Economics*, Vol. 41, No. 3, August, 1959, pp. 528-534. (University of California, Giannini Foundation Paper 177.)

between fresh and processing outlets with relative ease as compared to other types of handling firms. Most of these advantages stem from the ability of these firms to control their own production and packing operations in the light of overall cost and income relationships rather than solely on the basis of any one segment, such as fresh packing.

Potential increases in marketing efficiency that may be possible through plant consolidation and greater utilization of packing and storage facilities may be offset by some of the apparent advantages of grower-shipper type operations as discussed above. In particular, higher degrees of integration among related production and marketing operations, including processing, may be necessary. Similarly, technical progress may hinge upon the ability and willingness of marketing firms to exert greater leadership in the development and adoption of new techniques.

THE IMPACT OF MARKET STRUCTURE AND ORGANIZATION ON INDUSTRY INCOMES

Under competitive conditions, producers would allocate their supplies among the available alternative markets in accordance with relative prices in such a way as to maximize incomes. However, the numerous "imperfections" which exist prevent the systematic determination of prices, outputs, and incomes that would prevail under perfect competition. Many of these imperfections stem from the structure and organization of the markets for these fruits.

Producer Incomes

This study does not specifically consider the factors bearing on pricing in the processing markets for these fruits. However, it is apparent from data presented in this report that these factors are highly related to returns to producers from the fresh market. Prices of fruits which have a processing alternative reflect the allocation of tonnage between fresh and processing outlets.

A recent study of grower-processor integration in the California tomato industry concluded that prices received by growers and paid by processors were

essentially at competitive levels.^{1/} Many of the same processors are involved in both the tomato and deciduous fruit industries; hence, the structure on the buyers' side of the market is probably much the same. On the sellers' side, grower bargaining associations negotiate prices for many of these fruits moving to canners. At the time of the tomato study, such an association was in existence in that industry but was not considered highly effective. Most of the deciduous fruit associations are well established and control substantial shares of total tonnage. Sales control of many of these fruits for processing is considerably more centralized than for the fresh market.

If the greater utilization of grower bargaining associations in selling these fruits to processors results in more favorable pricing conditions in that market than in the fresh market, more supplies may be expected to be allocated to processing. Circumstances which would tend to reduce seller bargaining power in the fresh market, such as the apparently increasing dependence on fewer large-scale buyers, might provide further impetus for allocation to processing. Market risk and longer periods of price uncertainty for fresh market fruit might also favor processing.

Regulations imposed under marketing orders have tended to place more stringent grade restrictions on fresh market fruit as compared to that moving to processors. These regulations generally lead to a limitation on quantities available for fresh marketing. The direct effect of such limitations on total revenue from fresh fruits is dependent upon the elasticity of demand for these fruits at the appropriate exchange level--that at which the grower transfers title to the fruit to the buyer. If demand is elastic, any limitation on volume sold would tend to reduce industry revenue; however, little information is available upon which to measure this result. If consumer demand is increased due to quality and size regulations and unit prices are thus raised, any adverse total revenue effects such as mentioned might be offset. However, if the processing alternative is available, increased tonnage may be allocated to that outlet due to regulations placed on fresh shipments; hence, grower prices in the processing outlet are likely to be adversely affected.

^{1/} Norman R. Collins, Willard F. Mueller, and Eleanor M. Birch, Grower-Processor Integration: A Study of Vertical Integration Between Growers and Processors of Tomatoes in California, California Agricultural Experiment Station Bulletin 768 (Berkeley, 1959), pp. 60-61.

There is little effective demand for these fruits for the fresh market prior to the addition of the first handlers' services. Charges for such services as packing, loading, and cooling; inspection fees; and industry assessments are relatively fixed costs per unit handled. Thus, grower returns from the fresh market are directly affected by the first-handling function and by savings made through technical changes or other methods of increasing the efficiency of these operations.

Most of the technical changes adopted by first handlers surveyed have largely affected internal handling operations rather than the characteristics of the packed product. Hence, savings from such innovations are not likely to result in lowered market prices, at least in the short run. Most first-handling firms appear to be in competition for fruit supplies, and many firms have capacity for additional tonnage during most of their season. Under these conditions, and in view of cooperatives' influence, it is likely that internal savings are soon reflected in charges made for services performed. Due to the inflationary conditions which have existed since World War II, such savings probably have been of more aid in keeping charges from rising at a faster rate than in reducing them, but the effect has been the same. In the long run, higher grower returns resulting from such innovations would tend to result in expanded production and eventually benefit consumers through lower prices.

Savings from technical innovations which lower costs but alter the product as it is presented to the buying trade may be distributed somewhat differently. Experience with carton packs, for example, has indicated that market discounts tend to absorb at least part of savings made, at least over the short periods for which evidence is available. Without extended experience and detailed studies it is probably not possible to predict the impact of such changes on producer incomes. However, to the extent that reductions in handling costs are greater than price discounts, producers should benefit much as they do from internal improvements of first handlers.

Underutilization of plants and failure to achieve available economies of scale tend to increase handling charges. However, these may be offset to some extent by other conditions. For example, a grower-shipper may operate a packinghouse and storage facility which suffer from the above problems, but he may be able to overcome the effects of these by using labor, including his own, and equipment which otherwise would not be fully utilized.

First Handler Incomes

Gross income of first handlers is derived largely from a charge per unit (box or ton) of fruit handled which is deducted from fruit returns.^{1/} Tonnage handled may be reduced by two types of grower actions: (1) producers of fruits which have a processing alternative may allocate their tonnage to processing outlets and thereby reduce total fresh volume and (2) producers are in control of marketing order administrative bodies, and acting through these they may enact grade, size, and shipping regulations which would reduce fresh tonnage.

Unless first handlers are able to increase unit charges or lower unit costs sufficiently to offset such tonnage reductions, their incomes will be correspondingly reduced. The feasibility of raising charges depends upon the nature of competition within the first-handling segment, and information obtained in this study indicates that competitive conditions probably prevail in the market for the services of these firms. The number of handlers in each district relative to the tonnage available is apparently sufficient to preclude effective collusion in respect to charges. The fact that cooperatives operate in most districts should aid in the maintenance of competition. In addition, in most cases, all types of firms have capacity for additional growers, and this situation should promote competitive conditions among first handlers.

In view of the conditions considered above and the discussion in the previous section, it is likely that short-run gains from internal cost savings go largely to producers rather than to first handlers. Also, any relative rise in charges for fresh handling is likely to result in greater tonnage of some fruits moving to processors and a further reduction of first-handler volume.

It seems apparent that any reduction in fresh market volume will probably reduce the total income of the first-handling segment of the industry regardless of higher prices obtained in the market. Hence, producer and handler objectives in this respect may not be entirely compatible. Such a situation might be expected to lead to a greater degree of first handler-producer

^{1/} Accounting procedures of grower-shippers handling their own fruit may not differentiate the first-handling function from that of production in determining gross income to the firm; however, for other types of firms and in relation to fruit handled by grower-shippers for other growers, such a unit charge for services is the principal income source.

integration in order for both segments to gain from market price enhancement, such as that attempted through some marketing order regulations.

Sales Agency Incomes

Increased gross returns to sales agencies result from higher total revenues from fresh fruit sales in approximately the same manner as do producer returns. That is, increased volume of sales would increase revenue under elastic demand conditions or decrease this total revenue if demand were inelastic. In addition, since sales agency charges are generally a percentage of the sales price, increased prices will also tend to aid agency revenue.

Sales agency and producer gross income determinants are much the same--both are dependent on total revenue. Many producer decisions bear directly on agency operations; hence, a relatively high degree of interfirm coordination might be expected. However, under current industry organization there are very few cases where such coordination seems to exist.

SUMMARY AND CONCLUSIONS

There is a high degree of interdependence between production and marketing developments affecting the California fresh deciduous fruit industry, much as is the case in the total food industry. Thus, although the subject of this study is that segment of the state's deciduous fruit industry that is principally concerned with marketing these fruits in the fresh form, it is apparent that the relationships with sources of supply, alternative utilizations, and sales outlets must be considered.

The industry segments emphasized have been the first handlers--growershippers, cooperatives, and commercial packers--and California sales agencies. These segments include the major sellers of these fresh fruits; hence, it is at the level of these firms that the critical bargaining relationship occurs between buyers and sellers. The study utilizes the generally recognized framework of market structure analysis; and it attempts to describe market structure, organization, and practices in the industry. Certain aspects of industry performance are appraised, largely through comparison of observed performance with that expected under competitive conditions.

There is a wide variety of California fresh deciduous fruits, and many of these are produced in large volume. Long-run supply is related to consumer demand and supply-price response at the producer level. However, the produced supply each season is allocated by growers to available alternative outlets.

Those fruits for which processing is a feasible alternative are allocated between the fresh and processing markets. In the processing market, there are relatively few buyers, pricing is generally in advance of harvest, grade requirements are quite specific, and formal contracts cover most phases of the transaction. Although fewness of buyers on the processing side of the market suggests the possibility of bargaining advantage to processors, this may be largely offset due to the existence of the fresh-market alternative for many types of fruit and the bargaining associations among growers of some fruits which tend to concentrate producers' bargaining power. These considerations, plus the results of a recent study of grower-processor relationships in the California tomato industry cited earlier, seem to indicate that prices in the processing market for these fruits are largely competitively determined. However, relationships would require further detailed study if more conclusive determination were to be made.

An additional factor affecting allocation decisions of producers is the uncertainty surrounding the returns from the alternative outlets. Unlike the majority of sales to processors, where price may be stipulated in advance and title passes at the farm gate or the processing plant, title to fruit allocated retained by the grower for a considerable period subsequent to delivery to the first-handler level. Such uncertainty may lead producers to allocate supplies between fresh and processing utilization on the basis of discounted fresh-market prices. Thus, in attempting to maximize profits, the individual grower seeking to avoid additional risk would increase allocation to the processing outlet. Data presented in this report tend to support this conclusion, as it was shown that returns per ton to growers from the processing market are consistently lower than from fresh sales; however, an increasing proportion of the total output is moving to that utilization.

The influence of marketing orders in effect for these fresh fruits is another element affecting producer allocation decisions. Operations under these orders are largely producer controlled through advisory board majorities. Although evidence discussed earlier indicates that the advertising and promotional programs carried on under these orders are relatively minor and probably

have little effect on consumer demand, the volume limitations--chiefly grade and size regulations--have been made increasingly stringent and have no doubt been effective in limiting fresh market supplies at times. However, there does not seem to be substantial evidence that these collusive actions have greatly modified the nature of competition facing these producers.

Fruit allocated to the fresh market moves from the grower to the first handler. These two levels are not independent of each other. The degree of integration between them varies from full ownership in the case of the grower-shipper to highly informal arrangements in which there is little effective coordination between the two firms. Hence, the specific types of integration and interfirm coordination must be recognized in considering the structure and performance of the industry.

The first handler-sales agency segment of the industry performs the principal marketing functions required for sale of these fruits in the fresh form. The level of this performance depends in large measure on the structure and organization of this segment and its markets. A major part of this study is concerned with the evaluation of such structural variables as product differentiation, entry conditions, degree of concentration, and the extent of integration. Information on the nature of these variables should aid in determining the degree to which the attributes of the industry and its markets vary from those expected under perfectly competitive conditions.

After sorting and grading, fruits within a specified category might be considered relatively homogeneous; however, individual first handlers differentiate their products by relating their brands to specific within-grade classes, certain handling and packing methods, and other factors such as long-established firm reputations. Results of a study reported earlier indicate that auction prices for some of these fruits tended to show that buyers attach significance to such differentiation. However, virtually none of the individual marketing firms carry their advertising through to the consumer level; hence, little effective demand expansion for specific brands at that level can be expected.

Product differentiation based on the fact that fruit is produced in California is attempted through industry advertising programs carried on under marketing order authority for most of these fruits. In addition, marketing organizations in some production districts use trade journal advertising to relate their products to the particular area. Although this type of group promotion may be of some value in stimulating total demand for the product, it is

not aimed at the development of individual seller differentiation, which would tend to alter the competitive conditions within the industry.

Most of the structural barriers to entry by new firms--such as the existence of a high degree of product differentiation, high levels of initial investment, and control of patents or strategic inputs by established firms--do not seem to pose major barriers to potential entrants. An exception for some entrants may occur in relation to obtaining adequate supplies of fruit for handling or sale. In addition, many existing firms have long-established reputations in the trade which may give them a distinct advantage over new entrants, although the importance of this factor is difficult to appraise.

The problem of obtaining fruit supplies is probably most easily overcome by entering grower-shippers who produce significant volumes to provide at least a large share of fruit required for efficient operation. However, other types of entrants might find it difficult to procure adequate supplies, thus reducing entry to some extent.

There is little evidence of a high degree of seller concentration in this industry. On the basis of annual volume it is, for most fruits, not until the 50 largest volume firms are included that the tonnage controlled exceeds 50 percent of total fresh sales of that fruit. The five largest sales agencies handle the sales of only about 27 percent of the total tonnage of these fruits sold fresh. These ratios, however, should be qualified with regard to seasonality of harvesting and marketing. For example, as the marketing emphasis shifts from one district to another during the season within the state, the degree of sales control over a particular type or variety of fruit may vary considerably. This may tend to increase the degree of seller concentration in particular portions of the season. On the other hand, the availability of similar fruit from other states during various periods of the season tends to weaken any tendency toward concentration among California sellers.

On the buyers' side of the market, the degree of concentration of purchasing appears to be increasing. Not only have volumes purchased by the major chain store buyers increased in recent years, but many of the medium-size retail operations also have expanded the volume of purchasing through buying groups or have established procurement organizations of their own. Thus, an increasingly large share of retail outlets are represented by fewer procurement organizations.

Interrelated in many respects to the degree of concentration within the California fresh deciduous fruit industry is the nature of the horizontal and vertical integration present. Sales control should be increased if first-handling facilities are tied together through common ownership or contractual arrangements. This may be accomplished through integration with firms on the sales agency level. Data presented in this study indicate that there is little horizontal integration among first-handling firms. Most firms operate a single plant. However, about 14 percent of the local facilities in various districts are operated by sales agencies and are linked in this manner.

A principal determinant of the effectiveness of sales control by firms selling these fruits, whether a first handler or sales agency, is the nature of the procurement arrangements used. Evidence presented in this study shows that, with the exception of grower-shippers handling their own fruit, procurement agreements are generally informal and where contracts exist they are seldom rigidly enforced. This is apparently due to traditional practice, and also it may result from the competition among handlers and agencies for fruit supplies, which is largely based on nonprice factors, including in large measure grower goodwill. Hence, although the framework exists for sales control by agencies of about one-half of the fruit sold, this control may not be highly effective due to the type of marketing arrangements upon which it is based.

The various aspects of seller bargaining strength mentioned in much of the preceding discussion suggest that, in general, sellers in this industry may lack many of the characteristics usually associated with market power. On the buyers' side of the market, concentration seems to be increasing. However, other studies have shown that the prices paid by the major buying organizations in the food industry probably approximate competitive levels, perhaps due largely to the influence of the extensive fringe of small buyers in the market in addition to the few relatively large firms. These considerations tend to show that prices for these fresh fruits may not vary greatly from competitive levels; however, there are indications that increasing bargaining strength on the buyers' side of the market is not likely to be offset with similar strength on the sellers' side. Since producers' returns in their alternative markets govern their allocation decisions, the extent that prices for the fresh product depart from those that would result from perfectly competitive conditions will result in some misallocation of supplies. However, the nature of competitive conditions in the processing market must be considered in evaluating the efficiency of total crop allocation.

Reduction in marketing costs achieved by first handlers and sales agencies should bear directly upon producer incomes under the competitive conditions apparent in this segment of the industry. Such savings may result from greater utilization of facilities, achievement of available scale economies, and adoption of new technical developments.

A basic constraint on full utilization of facilities--packinghouses and cold storage plants--is seasonality of harvest of these fruits. In practice, packing facilities in most districts are utilized for only the length of the harvest season in that district. The state average is 79 days of operation per year. The number of days per year that facilities in any district are operated is directly related to the length of harvest season and the storability of the particular fruit. Many of these fruits can be stored only very short periods; others are capable of storage for as long as six to eight months. There is little storage of fruit prior to packing, but storage after packing is widely used to extend the marketing season. However, the average storage plant operated by first handlers is utilized less than 50 percent of capacity almost eight months of the year.

Analysis in this study indicates that, among the various types of fruit, considerably less than optimum adjustment is achieved in relation to scale of plant. As much as 30-80 percent of the tonnage may be packed in plants operating below the optimum rates of output estimated by recent research studies.

Plant utilization and scale of operation may be increased through multiple-product operations. In some districts, most of the plants handle two or more types of fruit. The effect on plant economies depends on time of harvest. If this involves simultaneous handling of several types of fruit, plant scale will be increased, but utilization of given facilities is increased in peak periods for different varieties come at different times or the product mix tends to extend the season.

It seems that productive efficiency in this industry could be increased through consolidation of plants to achieve scale economies or higher utilization of plants and equipment. Such savings could be expanded if hauling costs and fruit characteristics were such as to make it feasible to assemble products from various districts with somewhat different seasons. However, the institutional setting of the local industry gives much emphasis to independence of operation of firms within the various districts, and this local orientation, especially of grower-shippers and cooperatives, seems to reduce the probability of such consolidation or interdistrict transfer, even if economically feasible.

Individual plants and equipment seem to be regularly modernized and improved in this industry. New techniques involving internal plant efficiency are apparently rapidly adopted. This is in accordance with a priori expectations; that is, firms adjust to existing competitive conditions in attempting to optimize their own operations. However, industry performance is not optimized in this manner. For example, there is evidence that the nature of inter-firm agreements between handlers and growers is not such as to assure efficient coordination of rates of harvesting and rates of packing. Thus, handlers, particularly those packing fruit produced by a large number of growers, may intentionally provide capacity in excess of that needed to cope with supply variations resulting from weather or other natural conditions in order to cope with such problems. The effect is to increase overcapacity and reduce industry efficiency.

Although individual firms tend to develop and readily adopt internal plant improvements, these generally involve more efficient handling of the traditional packed product rather than substantial change in the characteristics of those products. Recent studies have shown that techniques such as bulk filling and bulk handling of many of these fruits may offer substantial cost savings. Such developments alter the nature of the packed product, and under the existing decentralized organization of the industry no individual firm is likely to be in a position to successfully initiate such changes due to fear of receiving market price discounts in excess of savings.

In addition, under traditional day-to-day selling procedures it is difficult to assure in advance buyer acceptance or reorders of new products. Such market uncertainty tends to reduce the impetus for product innovation among first handlers, especially those handling fruit for other growers on a consignment or cooperative basis.

Implications for Future Developments

Data presented in this report indicate that the acreage of the various major types of deciduous fruits in California is likely to expand as much as 25-43 percent by 1975. The state's share of total United States production has increased about 10 percent since the 1920's, and this trend is expected to continue.

The location of production within the state is shifting somewhat, due largely to the sharp increase in the acreage of these fruits in the San Joaquin Valley as compared to other areas. There is evidence of an increase in the size of farms, especially in the Central Valley. Although many varieties of most of these fruits are produced, the major volume of fresh shipments is increasingly concentrated on a few principal varieties of each type of fruit.

The major utilization trends observed are the increasing emphasis on processed forms of these fruits and the dramatic decline in their per capita consumption, especially in fresh form, during the past few decades.

These trends in production and utilization suggest that the adjustments likely to be required by the California industry during the next decade will reflect both the changing nature of food distribution and the changing nature of the industry itself. Efficient marketing of these fruits calls for California fresh handlers and processors to develop and adopt techniques and procedures that will meet the requirements of these changing conditions.

This study is principally concerned with the fresh marketing sector. This sector seems to face two major types of problems in its adjustment to the changing conditions discussed. These involve increasing marketing efficiency and maintaining or improving competitive position.

Two types of relatively new handling techniques which have been discussed--bulk filling of containers and bulk bin handling--should aid in increasing efficiency through lower container costs per pound of fruit and decreased packing expense. Shifting to new techniques of this kind is likely to affect industry structure in a number of ways. Optimum scale of operation, for example, may be increased if equipment required is of large capacity per unit and involves heavy investment. To insure adequate volumes, plants may have to consolidate and widen their supply areas. If less specialization of packing containers and methods among the various fruits is fostered, utilization of plants and equipment should be increased; hence, fewer facilities should be required. If bulk bins are found to be feasible for fresh shipment, large buyers may be able to receive fresh fruits in bins directly at their warehouses or retail outlets. In addition, these techniques may be found useful in connection with consolidation facilities for assembling mixed truckloads at central points in California.

Bargaining power on the buyers' side of the market for fresh deciduous fruits seems to be increasing. In order to maintain its competitive position, greater centralization of sales control in the California industry may be

required. In addition, other methods of increasing market power should be investigated. One method which has been little exploited by this industry is the development of product differentiation at the consumer level. This may be available through prepackaging under sellers' brands coupled with consumer advertising, probably by large-scale, centralized selling organizations. Such a development might be related to the utilization of bulk containers for shipment to prepackaging facilities operated by California firms in market centers.

Prepackaging by California firms at shipping point has not been generally satisfactory. However, the cost of repacking into consumer-size units at market centers may be excessive, especially in view of the cost of initial shipping point packing using traditional methods. Under these conditions, it may become feasible to combine bulk packing at shipping point with prepackaging at the market. Such facilities in market centers would be utilized by a large number of first handlers from all districts and for many varieties and types of fruit; hence, high levels of plant utilization should be achieved. These types of changes in marketing techniques require intensive research in relation to such matters as the feasibility of shipping various types of fruit in bulk containers, probable market acceptance, the effect on costs, and the impact of such changes on industry structure and organization.

Appendix Table A.1

Production of Selected Deciduous Fruits, United States and California, 1924-1960

Year	Apples			Apricots			Sweet cherries ^a			Grapes (all varieties)			Metarines ^b			Freestone peaches			Pears			Plums		
	United States production	California production	California as per cent of production	United States production	California production	California as per cent of production	United States production	California production	California as per cent of production	United States production	California production	California as per cent of production	United States production	California production	California as per cent of production	United States production	California production	California as per cent of production	United States production	California production	California as per cent of production	United States production	California production	California as per cent of production
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
	1,000 tons												1,000 tons											
1924	3,146.2	191.4	6.1	136.0	136.0	100.0	13.5		1,774.2	1,535.0	86.5					1,123.1	204.8	18.6	449.4	133.0	29.6	47.8	42.0	87.9
1925	2,968.7	129.4	4.3	149.0	149.0	100.0	12.0		2,199.7	2,050.0	93.2					874.4	178.0	19.7	404.1	161.0	37.4	57.7	54.0	93.6
1926	4,503.1	222.6	4.9	173.0	173.0	100.0	20.1		2,353.7	2,059.0	88.8					2,053.4	225.0	11.6	597.6	204.0	34.7	82.4	79.0	89.8
1927	2,965.8	160.4	7.1	207.7	206.0	99.2	12.0		2,591.7	2,406.0	92.8					730.4	175.0	24.0	438.4	181.0	41.3	61.9	59.0	93.7
1928	3,406.6	281.7	8.1	177.3	173.0	97.6	16.6		2,635.0	2,366.0	89.8					1,195.5	218.0	18.4	567.8	226.0	39.4	73.9	67.0	90.7
1929	2,649.1	169.4	6.4	220.4	212.0	96.2	16.3		2,086.1	1,927.0	87.6					908.6	136.0	17.2	521.4	190.0	36.4	44.0	40.0	90.1
1930	3,077.1	250.4	8.2	198.4	194.0	97.8	15.3		2,457.5	2,181.0	88.7					811.4	280.0	34.5	632.0	285.0	45.1	89.5	82.0	91.6
1931	4,087.6	195.9	4.9	261.0	274.0	97.5	23.0		1,647.3	1,390.0	80.1					1,471.3	203.0	13.8	606.7	219.0	36.1	72.1	64.0	87.6
1932	2,878.6	194.5	6.8	272.0	266.0	97.8	18.5		2,232.6	1,998.0	89.3					718.6	210.0	29.2	585.3	244.0	41.5	79.3	68.0	91.5
1933	2,914.5	198.5	6.8	271.1	268.0	98.9	15.3		1,936.6	1,660.0	85.6					756.4	202.0	26.6	576.2	222.0	38.5	61.5	57.0	92.7
1934	2,544.1	138.4	5.4	151.7	139.0	90.4	17.0		1,957.6	1,700.0	86.8					842.4	191.0	22.7	674.3	234.0	34.7	67.5	62.0	91.9
1935	3,369.6	213.1	6.3	227.5	216.0	94.9	15.0		2,477.4	2,194.0	88.6					1,042.5	157.0	15.1	682.6	165.0	26.5	53.7	48.0	89.4
1936	2,352.6	191.7	8.1	251.0	248.0	96.5	23.0		1,897.4	1,714.0	90.3	9.7 ^c	9.7	100.0		833.1	134.0	16.1	655.8	241.0	36.7	67.9	64.0	94.3
1937	3,678.1	223.2	6.1	324.4	311.0	95.9	21.6		2,765.2	2,454.0	90.0	11.0	11.0	100.0		1,071.1	186.0	19.2	701.1	227.0	32.4	71.6	66.0	92.8
1938	3,171.2	175.7	5.5	189.4	166.0	89.5	79.4	37.8	2,571.2	2,531.0	94.8	10.0	10.0	100.0		961.1	197.0	20.1	760.9	284.0	37.3	65.5	63.0	96.2
1939	3,341.9	191.6	5.7	331.5	312.0	94.1	87.7	36.0	41.0	2,449.0	2,226.0	91.0	13.4	13.4	100.0	1,169.3	231.0	19.8	702.7	253.0	36.4	71.0	68.0	95.6
1940	2,674.5	154.9	5.8	187.1	193.0	103.0	81.0	16.1	2.0	2,466.4	2,250.0	91.2	8.4	8.4	100.0	1,034.9	232.0	22.4	710.2	226.0	31.8	74.0	69.0	93.2
1941	2,933.2	134.9	4.6	211.9	198.0	92.6	80.3	21.0	2.0	2,724.9	2,547.0	93.5	9.5	9.5	100.0	1,476.7	227.0	15.4	699.1	223.0	31.9	76.9	71.0	90.1
1942	2,041.0	141.5	4.7	228.1	204.0	89.4	61.2	33.0	36.2	2,395.5	2,160.0	90.2	12.4	12.4	100.0	1,177.2	266.0	22.6	725.9	242.0	32.8	75.2	72.0	94.5
1943	2,030.4	208.0	10.0	104.0	80.0	76.6	71.6	17.0	31.7	2,371.7	2,095.2	89.1	12.0	12.0	100.0	676.2	249.0	36.8	581.7	301.0	51.7	75.5	75.0	96.8
1944	2,935.4	147.5	5.1	331.8	304.0	92.1	88.7	27.0	3.0	2,695.8	2,514.0	93.3	17.0	17.0	100.0	1,388.1	325.0	23.3	745.7	290.0	38.5	80.5	72.0	90.1
1945	1,600.5	224.1	13.9	151.5	159.0	105.0	102.4	30.0	31.1	2,765.8	2,663.0	96.2	13.0	13.0	100.0	1,435.5	249.0	19.1	780.4	314.0	37.3	72.7	71.0	97.7
1946	2,703.6	183.6	6.4	338.7	306.0	90.3	112.4	34.0	30.2	3,137.3	2,955.0	94.2	16.0	16.0	100.0	1,434.5	251.0	21.4	802.5	310.0	38.6	116.0	100.0	86.2
1947	2,791.4	266.0	9.8	201.2	265.0	132.0	79.3	33.0	30.0	3,080.0	2,836.0	92.1	15.0	15.0	100.0	811.9	272.0	33.2	749.2	341.0	45.5	79.2	74.0	93.4
1948	2,143.9	140.0	6.6	246.1	219.0	89.0	79.6	23.5	29.5	3,061.0	2,894.0	94.6	12.7	12.7	100.0	1,594.7	223.0	23.4	899.6	256.0	28.7	71.8	67.0	93.3
1949	3,261.0	226.7	7.0	196.7	165.0	83.9	136.4	44.0	38.2	2,614.2	2,470.0	94.6	16.6	16.6	100.0	1,082.1	267.0	24.7	817.6	322.0	41.7	97.9	97.0	96.3
1950	2,971.4	162.0	5.4	215.0	213.0	99.1	82.1	11.0	31.8	2,667.9	2,440.0	91.5	12.4	12.4	100.0	1,243.0	240.0	19.3	703.5	240.0	34.0	81.5	77.0	93.5
1951	2,672.8	152.0	7.0	181.2	175.0	96.6	70.5	19.0	31.8	3,178.1	2,828.0	95.6	12.0	12.0	100.0	938.0	272.0	29.0	720.7	360.0	50.0	104.6	97.0	92.5
1952	2,260.0	220.8	9.7	177.6	158.0	89.0	100.5	39.5	39.5	3,165.5	2,967.0	94.0	15.0	15.0	100.0	1,042.4	270.0	25.9	742.7	395.0	53.1	60.5	53.0	87.6
1953	2,886.8	178.2	7.5	243.2	230.0	94.6	91.6	27.0	39.5	2,995.5	2,475.0	82.6	10.0	10.0	100.0	1,004.4	254.0	25.3	666.9	290.0	43.4	82.0	76.0	92.6
1954	2,682.4	229.0	8.5	159.0	140.0	87.6	97.9	23.0	39.5	2,549.9	2,357.0	92.8	15.8	15.8	100.0	1,007.0	276.0	27.6	708.9	402.0	56.7	77.3	71.0	91.8
1955	2,349.6	226.6	9.9	281.5	253.0	89.9	113.1	34.0	30.2	3,001.1	3,016.0	100.3	2.2	2.2	100.0	701.8	274.0	39.0	710.9	347.0	48.8	91.2	86.0	94.3
1956	2,480.4	222.2	9.2	195.9	186.0	94.9	66.3	34.3	30.2	2,912.3	2,641.0	90.7	19.0	19.0	100.0	1,031.9	301.0	29.2	775.7	425.0	54.8	104.9	100.0	99.5
1957	2,245.2	214.7	7.5	191.4	167.0	87.7	91.0	31.4	33.8	2,996.6	2,382.0	81.7	30.0	30.0	100.0	959.0	291.0	30.3	760.2	418.0	55.0	86.1	81.0	93.7
1958	1,938.6	231.6	7.6	108.0	90.0	83.3	87.6	13.5	39.5	3,026.1	2,741.0	90.6	34.0	34.0	100.0	1,200.7	276.0	23.2	693.4	347.0	50.0	68.8	61.0	88.7
1959	2,922.9	250.6	8.6	230.4	210.0	91.1	78.2	15.0	19.2	3,136.7	2,861.0	91.2	39.0	39.0	100.0	1,175.1	326.0	27.9	701.8	405.0	57.7	99.8	93.0	93.2
1960	2,604.4	213.4	8.2	243.1	230.0	94.6	70.5	24.0	30.2	2,996.6	2,698.0	89.9	44.0	44.0	100.0	1,171.6	290.0	25.4	614.9	363.0	59.0	89.0	81.0	91.0

^a Sweet cherries not separated from sour cherries prior to 1938.Cols. 2, 5, 8, 11, 14,
17, 20, 23;^b Metarine data not available prior to 1936.^c Metarine production only reported for California.

Source:

For years 1953-1960—California Fruit and Livestock Reporting Service, *California Fruit and Nut Crops, 1952-1955*, Acreage, Production, Utilization, Value, Special Publication No. 261 (Sacramento, July, 1956), pp. 12, 17, 23, 34, 44, 78, 82, and 95.

California Fruit and Livestock Reporting Service, *California Fruit and Nut Crops* (Sacramento, May 1, 1960), pp. 3-5.

Id., May 1, 1961, pp. 3-5.

Cols. 1-24: For years 1924-1952—Sidney Hoot and Varden Fuller, *Trends and Prospects: Deciduous Tree Fruits*, University of California, United Fruit Production Information Report No. 176 (Berkeley, 1955), pp. 95-100.

Cols. 1, 4, 7, 10, 13,
16, 19, 22;

For years 1953-1960—U. S. Agricultural Marketing Service, *Fruits (Non-citrus) Production and Value, 1953-1960* issues.

For years 1958-1960—Id., for sweet cherries.

Appendix Table A.2

Acreage--Bearing, Nonbearing, and Total--Selected Deciduous Fruits, California, 1924-1960

Year	Total acreage			Apples			Apricots			Cherries			Grapes (all)			Nectarines			Freestone peaches			Pears			Plums		
	Bear- ing	Non- bear- ing	Total	Bear- ing	Non- bear- ing	Total	Bear- ing	Non- bear- ing	Total	Bear- ing	Non- bear- ing	Total	Bear- ing	Non- bear- ing	Total	Bear- ing	Non- bear- ing	Total	Bear- ing	Non- bear- ing	Total	Bear- ing	Non- bear- ing	Total			
	1,000 acres																										
1924	724.3	231.2	955.5	51.6	7.4	59.0	65.2	30.5	95.7	9.2	5.3	14.5	469.6	128.2	597.8	0.5	0.7	1.2	58.4	15.0	73.4	45.2	34.9	80.1	24.6	9.2	33.8
1925	791.6	240.2	1,031.8	52.6	7.1	59.7	68.3	28.6	96.9	9.4	5.7	15.1	527.3	90.3	617.6	0.6	0.9	1.5	57.2	15.4	72.6	48.9	35.6	84.5	27.3	7.7	35.0
1926	841.3	154.1	995.4	52.8	6.5	59.3	70.0	23.3	97.3	9.9	5.8	15.7	564.9	64.8	629.7	0.7	0.9	1.6	56.7	13.3	70.0	53.3	33.3	86.6	29.0	6.2	35.2
1927	865.1	124.1	989.2	52.4	5.7	58.1	60.1	16.2	96.3	10.8	5.4	16.2	578.2	49.6	627.8	0.8	0.9	1.8	56.1	11.5	67.6	56.7	30.0	86.7	29.9	4.8	34.7
1928	869.9	103.1	973.0	50.5	5.6	56.1	81.0	12.8	95.7	11.5	5.3	16.8	577.3	37.3	614.6	1.1	1.0	2.1	55.8	10.4	66.2	59.8	26.6	86.4	30.9	4.2	35.1
1929	860.5	894.9	945.4	46.4	5.1	51.5	82.6	10.8	93.4	12.0	5.4	17.4	565.7	28.5	594.2	1.4	0.9	2.3	54.0	9.2	63.2	64.8	21.0	85.8	31.6	4.0	35.6
1930	839.3	72.3	911.6	46.6	4.6	51.2	82.0	9.3	91.3	12.7	4.9	17.6	546.7	22.5	569.2	1.5	1.0	2.5	53.4	8.5	61.9	65.5	17.4	83.2	30.6	4.1	34.7
1931	818.5	63.8	882.3	45.3	4.4	49.7	81.2	8.2	89.4	13.3	4.6	17.9	528.5	20.2	548.7	1.7	0.9	2.8	52.5	7.7	60.0	66.0	14.1	80.1	30.0	3.9	33.9
1932	806.7	63.5	870.2	43.9	4.5	48.4	81.0	7.1	87.1	13.6	4.4	18.0	517.8	22.5	540.3	2.0	0.7	2.7	51.5	7.7	59.2	66.8	11.7	78.5	30.1	4.9	35.0
1933	783.6	61.1	844.7	42.0	4.1	46.1	78.6	6.1	84.7	13.9	3.9	17.8	503.0	24.2	527.2	2.2	0.5	2.7	49.4	7.1	56.5	65.6	10.1	75.7	29.9	5.1	34.0
1934	761.3	63.4	824.7	35.5	3.4	38.9	77.6	5.7	83.3	14.3	3.2	17.5	495.5	30.6	526.1	2.3	0.4	2.7	46.4	7.3	53.7	62.1	8.4	70.5	27.6	4.4	32.0
1935	743.8	66.5	810.3	34.9	3.0	37.9	76.3	5.5	81.8	14.4	2.8	17.2	489.4	34.7	524.1	2.4	0.5	2.9	42.6	7.3	50.9	57.4	7.5	64.9	26.4	4.2	30.6
1936	732.7	68.2	800.9	34.8	2.8	37.6	74.9	5.7	80.4	14.6	2.5	17.1	486.5	36.6	523.1	2.4	0.8	3.2	40.1	9.6	49.7	54.2	6.3	60.5	25.4	3.8	29.2
1937	742.8	63.2	806.0	35.1	2.6	37.7	75.3	5.6	80.9	14.9	2.1	17.0	496.3	32.3	528.6	2.4	1.0	3.4	39.5	10.6	50.1	53.6	5.5	59.1	25.7	3.5	29.2
1938	743.5	66.7	810.2	34.7	2.5	37.2	73.8	6.0	79.8	14.8	1.7	16.6	501.4	36.0	537.4	2.5	1.1	3.6	38.4	11.1	49.5	52.2	4.8	57.0	29.9	3.5	29.1
1939	743.7	63.4	807.1	33.8	2.5	36.3	73.1	5.8	78.9	14.7	1.4	16.1	505.9	34.9	540.8	2.6	1.0	3.6	38.6	10.5	49.1	50.3	4.0	54.3	24.7	3.3	28.0
1940	732.5	65.7	797.9	33.0	2.5	35.5	70.5	5.7	76.2	13.8	1.2	15.0	504.4	34.2	538.6	2.4	1.0	3.4	37.8	9.6	47.4	46.8	3.6	50.4	23.4	3.7	27.1
1941	735.0	55.4	790.4	31.8	2.4	34.2	69.1	4.8	73.9	13.1	1.1	14.2	511.6	30.6	542.2	2.6	1.0	3.6	38.2	9.1	47.3	45.6	2.9	48.5	23.0	3.5	26.5
1942	734.3	53.0	787.3	31.4	2.3	33.7	67.8	4.3	72.1	12.6	1.0	13.6	511.9	30.6	542.5	2.8	0.8	3.6	38.9	7.5	46.4	45.3	2.9	48.2	23.5	3.6	27.1
1943	732.7	51.2	783.9	30.3	2.2	32.7	66.7	3.9	70.6	12.5	1.0	13.5	511.9	27.3	539.2	2.8	0.9	3.7	39.2	7.0	46.2	45.2	2.8	47.8	23.7	3.4	27.1
1944	728.0	57.2	785.2	30.1	2.6	32.7	66.0	3.6	69.6	12.4	0.9	13.3	507.2	36.0	543.2	3.2	0.7	3.9	39.6	6.5	46.1	44.2	2.1	47.3	23.3	3.4	26.1
1945	712.7	74.4	787.1	29.5	2.5	32.0	64.9	3.1	68.0	12.2	0.9	13.1	499.8	51.8	551.6	3.2	0.6	3.8	38.7	7.3	46.0	44.9	2.0	46.9	24.0	5.8	29.8
1946	703.5	88.3	791.8	26.7	3.0	31.7	62.9	3.0	65.9	12.0	0.9	12.9	490.8	63.7	554.5	3.3	0.6	3.9	37.5	8.8	46.3	44.3	2.0	46.3	24.0	6.3	30.3
1947	692.9	98.1	791.0	27.4	3.4	30.8	59.4	2.0	62.4	11.2	1.2	12.4	489.1	66.5	555.6	3.2	0.6	3.8	35.2	9.9	45.1	43.3	2.2	45.5	24.1	6.3	30.4
1948	686.2	76.1	762.3	26.5	3.5	30.0	54.7	2.8	57.5	10.5	1.5	12.0	494.5	52.7	547.2	3.0	0.6	3.6	33.4	9.0	42.4	44.5	2.6	44.1	24.1	5.4	29.5
1949	682.3	62.7	745.0	25.8	3.4	29.2	49.8	2.5	52.3	9.9	2.1	12.0	496.6	37.6	534.2	2.9	0.8	3.7	32.2	8.2	40.4	41.2	3.2	44.4	23.9	4.7	28.6
1950	676.2	46.7	722.9	24.3	3.3	27.6	46.6	2.1	48.7	9.4	2.2	11.6	496.4	24.3	520.7	2.7	1.0	3.7	33.1	6.5	39.6	39.8	3.5	43.3	23.9	3.8	27.7
1951	696.4	41.6	696.0	23.9	3.0	26.9	44.4	1.5	45.9	9.5	2.3	11.8	489.8	19.1	508.9	2.4	1.4	3.8	32.1	6.8	38.9	39.7	3.9	43.7	23.5	3.6	27.1
1952	636.5	38.4	674.9	23.5	2.7	26.2	43.5	1.2	44.7	9.5	2.5	12.0	463.5	15.3	478.8	2.4	2.0	4.4	32.1	7.1	39.2	39.9	4.3	43.8	22.5	3.3	25.8
1953	624.0	35.7	659.7	22.3	2.1	24.4	42.8	1.2	44.0	9.5	2.5	12.0	441.4	11.8	465.9	2.6	3.3	5.9	31.9	7.3	39.2	38.9	4.3	43.2	21.9	3.2	25.1
1954	614.3	36.1	650.4	22.8	2.0	24.8	41.4	1.2	43.6	9.1	2.4	11.5	445.5	10.9	456.4	2.8	4.2	7.0	31.8	8.0	39.8	39.0	4.2	43.2	21.1	3.2	25.1
1955	587.4	32.2	639.6	22.1	2.4	24.5	39.7	2.8	41.5	9.3	3.5	12.8	423.8	17.2	441.0	3.0	5.2	8.2	30.6	11.3	41.9	38.8	5.8	43.6	21.9	5.0	26.1
1956	574.1	68.0	642.1	23.1	3.6	26.7	38.1	3.7	41.8	9.4	3.5	12.9	407.5	26.2	433.7	3.6	6.2	9.8	32.2	13.6	45.8	38.7	5.2	43.8	21.6	6.0	27.6
1957	566.6	78.5	645.1	23.1	4.3	27.4	36.7	5.2	41.9	9.4	4.3	13.7	399.0	30.8	429.8	4.7	7.0	11.7	32.7	15.4	48.1	38.7	5.5	44.2	22.3	6.0	28.3
1958	575.0	83.8	658.8	23.3	4.3	27.6	36.1	5.6	41.7	9.4	4.2	14.1	406.8	34.6	441.4	5.7	6.1	11.8	33.6	14.7	48.3	38.3	7.2	45.5	23.1	6.9	28.2
1959	579.3	96.1	675.4	23.2	4.3	27.5	35.5	6.1	42.6	9.9	4.5	14.4	409.1	45.7	454.8	6.3	5.5	11.8	34.1	13.0	47.1	38.4	9.4	47.8	21.8	7.6	29.4
1960	595.5	91.2	686.7	23.0	5.0	28.0	36.2	7.0	43.2	10.4	3.9	14.3	416.2	45.7	461.9	8.2	3.7	11.9	35.9	9.5	45.4	32.3	10.3	42.6	23.3	6.1	29.4

Sources:

Years 1924 through 1955--California Crop and Livestock Reporting Service, California Fruit and Nut Crops, 1909-1955, Acreage, Production, Utilization, Value, Special Publication No. 261 (Sacramento: July, 1956), pp. 12-13, 17, 23, 34, 56, 78, 82, and 95.

Years 1956 through 1960--California Crop and Livestock Reporting Service, Acreage Estimates, California Fruit and Nut Crops (Sacramento, annual issues).

Appendix Table A-3

Acres—Bearing, Nonbearing, and Total—Selected California Deciduous Fruits by Crop
Reporting Districts, 1930, 1940, 1950, and 1960

Districts/	Apples				Apricots			
	1930	1940	1950	1960	1930	1940	1950	1960
	acres							
1. Bearing	1,882	1,454	870	973	3	3	—b/	1
Nonbearing	2/	79	5	167		1		—
Total		1,533	875	1,140		4		1
2. Bearing	510	344	301	184	32	14	15	—
Nonbearing		7	55	48		14	17	—
Total		351	356	188				2
3. Bearing	275	179	66	45	7	1	—	—
Nonbearing		10	4	—		1	—	—
Total		189	70	45		2	—	—
4. Bearing	28,185	28,250	20,913	18,263	35,972	35,899	28,217	22,054
Nonbearing		1,576	2,442	3,929		2,601	1,189	2,381
Total		29,826	23,355	22,192		38,500	29,406	24,435
5. Bearing	1,224	583	700	563	9,200	8,730	6,666	5,807
Nonbearing		161	75	56		632	271	850
Total		744	775	619		9,362	6,937	6,657
5a. Bearing	1,574	634	551	516	20,050	15,040	6,131	5,893
Nonbearing		94	244	251		1,286	243	3,422
Total		728	795	767		16,266	6,374	9,315
6. Bearing	4,496	1,333	1,192	1,399	182	42	18	13
Nonbearing		92	565	288		1	—	1
Total		1,425	1,757	1,687		43	18	14
8. Bearing	6,331	2,261	1,347	1,011	16,000	11,152	4,672	2,427
Nonbearing		152	427	281		270	79	319
Total		2,413	1,774	1,292		11,422	4,751	2,746
All bearing	44,477	35,038	25,940	22,954	81,446	70,881	45,719	36,195
All nonbearing		2,471	3,787	4,976		4,732	1,784	6,973
Total		37,209	29,727	27,930		75,613	47,503	43,168

Districts/	Cherries				Grapes (raisin and table)			
	1930	1940	1950	1960	1930	1940	1950	1960
	acres							
1. Bearing	44	30	11	11	0	121	34	10
Nonbearing		6	—	1		—	—	—
Total		36	11	12		121	34	10
2. Bearing	51	24	24	15	115	105	97	—
Nonbearing		3	—	—		—	—	—
Total		27	24	15		105	97	—
3. Bearing	18	3	—	—	—	—	—	—
Nonbearing		1	—	—		—	—	—
Total		4	—	—		—	—	—
4. Bearing	4,945	6,196	4,344	4,226	663	1,236	321	513
Nonbearing		606	1,161	1,319		9	33	8
Total		6,802	5,505	5,545		1,245	354	521
5. Bearing	2,581	1,605	618	390	21,266	8,828	4,115	575
Nonbearing		276	44	209		83	27	5
Total		1,881	632	599		8,911	4,142	580
5a. Bearing	2,868	4,538	3,648	5,216	315,185	291,839	307,131	282,337
Nonbearing		1,132	643	5,232		19,319	10,397	36,016
Total		4,670	4,291	7,448		311,158	318,228	318,353
6. Bearing	876	512	250	195	1,483	544	234	110
Nonbearing		52	4	24		5	—	—
Total		564	254	219		549	234	110
8. Bearing	1,154	1,011	412	321	16,748	15,293	13,618	14,563
Nonbearing		34	87	77		1,124	3,243	1,252
Total		1,045	499	398		16,417	16,861	15,815
All bearing	12,537	13,919	9,307	10,374	357,460	317,936	325,750	298,108
All nonbearing		1,110	1,909	3,862		20,740	14,200	37,281
Total		15,029	11,216	14,236		338,676	339,950	335,389

(Continued on next page.)

Appendix Table A.3--continued.

Districts/	Hectares				Fasches (Fasstone)			
	1930	1940	1950	1960	1930	1940	1950	1960
	acres							
1. Bearing	--	--	--	150	122	13	24	
Nonbearing	--	--	--		7	5	1	
Total	--	--	--		129	18	25	
2. Bearing	1	--	--	248	130	100	47	
Nonbearing	--	--	--		--	14	62	
Total	1	--	--		130	114	109	
3. Bearing	--	--	--	29	35	24	44	
Nonbearing	--	--	--		--	20	--	
Total	--	--	--		35	44	44	
4. Bearing	232	155	126	3,259	2,402	1,039	472	
Nonbearing	26	10	21		279	324	87	
Total	260	165	147		2,681	1,363	559	
5. Bearing	201	78	29	9,237	5,061	5,044	4,526	
Nonbearing	61	4	92		1,064	391	1,038	
Total	262	82	121		6,125	5,435	5,564	
5a. Bearing	1,584	2,065	8,008	29,492	23,503	22,360	28,462	
Nonbearing	869	562	3,549		5,220	3,777	8,043	
Total	2,453	2,627	11,557		28,723	26,137	36,505	
6. Bearing	21	7	2	5,225	1,284	502	447	
Nonbearing	1	--	1		31	71	84	
Total	22	7	3		1,315	573	531	
8. Bearing	37	17	53	5,129	4,625	3,791	1,903	
Nonbearing	3	--	58		1,109	624	151	
Total	40	17	111		5,734	4,415	2,054	
All bearing	2,076	2,322	8,218	53,469	37,162	32,843	35,895	
All nonbearing	962	576	3,721		7,170	5,226	9,506	
Total	3,038	2,898	11,939		44,332	38,069	45,401	

Districts/	Fasches (all varieties)				Fasches			
	1930	1940	1950	1960	1930	1940	1950	1960
	acres							
1. Bearing	2,636	3,802	2,077	2,084	12	98	37	16
Nonbearing		31	64	1,680		7	1	2
Total		3,833	2,141	3,764		105	38	18
2. Bearing	195	63	40	20	17	5	2	1
Nonbearing		--	--	--		--	--	--
Total		63	40	20		5	2	1
3. Bearing	17	3	1	1	17	2	--	--
Nonbearing		3	--	--		--	--	4
Total		6	1	1		2	--	4
4. Bearing	26,899	22,187	17,253	15,805	2,413	971	880	929
Nonbearing		1,092	1,332	3,006		58	159	193
Total		23,279	18,585	18,811		1,029	1,039	1,122
5. Bearing	15,718	9,078	8,265	8,476	8,293	3,656	2,046	1,404
Nonbearing		396	678	3,198		409	270	747
Total		9,474	8,943	11,674		4,065	2,316	2,151
5a. Bearing	2,377	547	213	366	10,298	7,369	11,483	13,600
Nonbearing		47	6	952		955	1,569	4,631
Total		594	219	1,318		8,324	13,052	18,231
6. Bearing	11,717	10,089	10,660	9,033	9,800	9,056	8,150	6,546
Nonbearing		599	956	1,387		807	648	421
Total		10,688	11,616	10,420		9,863	8,798	6,967
8. Bearing	5,644	1,224	832	475	932	803	894	772
Nonbearing		47	59	13		134	209	139
Total		1,271	891	488		937	1,103	911
All bearing	46,993	39,321	36,260	31,782	21,960	23,492	21,268	
All nonbearing	2,215	3,095	10,316		2,370	2,856	6,237	
Total	49,208	42,416	46,576		24,330	26,348	27,505	

(Continued on next page.)

Appendix Table A.3--continued.

Districts/	Totals--all fruits listed					
	1940		1950		1960	
	Total all fruits	District as a percentage of state total	Total all fruits	District as a percentage of state total	Total all fruits	District as a percentage of state total
	acres					
1. Bearing	5,630	1.1	3,042	.6	3,119	.7
Nonbearing	131	.3	75	.2	1,851	2.2
Total	5,761	1.0	3,117	.6	4,970	.9
2. Bearing	686	.1	579	.1	267	.1
Nonbearing	10	.0	71	.2	66	.1
Total	696	.1	650	.1	333	.1
3. Bearing	223	.4	91	.4	90	.4
Nonbearing	15	.0	24	.1	4	.0
Total	238	.4	115	.4	94	.4
4. Bearing	97,373	17.8	73,122	14.5	62,388	13.2
Nonbearing	6,249	1.4	6,650	1.9	11,024	13.3
Total	103,622	17.6	79,772	14.8	73,412	13.3
5. Bearing	37,742	6.9	27,482	5.4	21,770	4.6
Nonbearing	3,082	.7	1,730	.5	6,195	7.5
Total	40,824	7.0	29,212	5.4	27,965	5.0
5a. Bearing	345,054	63.2	353,782	70.1	344,398	73.1
Nonbearing	27,862	6.6	17,911	5.3	59,096	12.4
Total	372,916	63.4	371,693	69.1	403,494	72.8
6. Bearing	22,851	4.2	21,013	4.2	17,745	3.7
Nonbearing	1,588	.3	2,244	6.7	2,206	2.7
Total	24,439	4.2	23,257	4.3	19,951	3.6
8. Bearing	36,406	6.7	25,583	5.1	21,525	4.6
Nonbearing	3,073	.7	4,728	1.1	2,330	2.8
Total	39,479	6.7	30,311	5.7	23,855	4.3
All bearing	545,965	100.0	504,694	100.0	471,272	100.0
All nonbearing	42,010	100.0	33,433	100.0	82,772	100.0
Total	587,975	100.0	538,127	100.0	554,044	100.0

a/ The Crop Reporting Districts are shown in Appendix Figure A.1.

b/ Dashes indicate data not reported.

c/ Blanks indicate no data available.

Source: California Crop and Livestock Reporting Service, California Fruit and Nut Acreage, Annual Issues, 1927-32, 1940, 1950, and 1960.

Appendix Figure A.1



Crop Reporting Districts, California, 1960

Sources:

California Crop and Livestock Reporting Service, California Fruit and Nut Acreage, as of 1960 (Sacramento, 1961).

Acreage percentages from Appendix Table A.3.

Appendix Table A.4

Interstate Passings of Selected California Deciduous Fruits, By Variety, 1934-1960

	1934	1935	1936	1937	1938	1939	1940	1941	1942	1943	1944	1945	1946	1947	1948	1949	1950	1951	1952	1953	1954	1955	1956	1957	1958	1959	1960	
															cherries													
Apples																												
Bellflower	28	17	23	2	17	7	5	7	5	12	7	93	3	4	2	1/											
Gravenstein	349	775	647	886	363	493	339	368	308	856	664	1,350	908	3	1,036	344	259	135	488	222	175	167	56	85	100	19	28	
Newtown	32	79	130	46	35	3	--	6	1	19	2	252	1	6	30	10	31	195	--	--	--	--	--	--	--	--	--	
Unclassified	23	55	88	105	49	52	145	28	45	164	80	1,031	63	339	25	81	31	7	80	10	17	9	7	--	--	--	--	
Apricots	340	398	532	607	454	619	355	504	418	372	1,007	916	961	741	593	533	773	482	505	506	341	493	317	288	50	190	256	
Cherries	787	502	750	645	775	792	390	533	758	505	786	988	870	821	461	815	1,034	555	928	849	652	928	901	643	269	351	399	
Table grapes																												
Almeria	44	77	91	109	141	211	80	262	195	239	104	310	352	145	291	368	237	378	640	198	196	382	510	241	456	380	312	
Cardinal	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	11	87	187	259	295	447	445	442	361	348	394	
Imperial	118	129	183	186	173	183	109	137	102	79	133	137	150	125	78	50	39	37	10	15	28	12	9	--	--	--	--	
Superior	3,644	3,252	4,478	4,609	4,262	4,787	5,390	5,635	5,240	7,708	5,589	6,462	6,820	9,370	7,708	7,447	9,006	9,367	8,804	6,192	7,497	8,065	5,078	6,018	5,627	6,555	4,564	
Malaga	2,261	1,764	1,987	1,691	1,447	896	1,428	873	899	2,843	1,563	1,568	689	670	252	173	243	215	120	50	132	41	75	19	48	14	36	
Muscat	61	41	28	17	51	68	38	44	11	--	--	--	--	--	--	--	68	32	59	66	70	36	85	57	40	20	20	
Perlette	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Red Malaga	593	765	594	840	662	542	719	725	521	1,450	1,266	815	1,493	1,254	794	468	531	1,149	984	593	737	811	495	321	274	328	136	
Ribier	298	340	341	359	343	317	312	435	552	793	759	643	811	657	570	513	460	528	550	552	736	552	562	656	439	339	433	
Thompson	4,169	4,459	4,940	5,062	5,424	5,057	5,763	6,475	5,769	385	697	5,109	5,734	6,785	7,523	6,052	5,748	5,608	6,899	6,744	6,246	8,033	7,077	6,811	5,898	6,739	6,000	
Toney	3,792	3,478	4,065	4,273	4,304	4,202	5,183	4,098	3,931	5,098	4,379	3,102	4,593	5,134	3,138	4,022	2,292	4,184	4,334	3,304	2,841	3,081	2,754	2,021	2,052	1,390	1,796	
Other	183	148	171	276	182	376	306	219	63	168	222	370	183	66	43	24	55	13	1	11	1	3	--	--	--	--	--	
Juice grapes																												
Alcanta	4,456	4,381	3,544	4,374	3,396	3,899	3,682	3,897	2,907	843	2,314	2,580	2,436	2,633	2,519	1,869	1,673	1,848	1,762	1,712	1,674	1,622	1,450	1,621	1,564	1,410	1,432	
Carignane	2,135	2,345	1,952	2,203	1,666	1,822	1,585	1,686	1,359	275	887	1,256	831	1,156	841	793	728	802	523	672	587	659	494	293	631	571	574	
Muscat	1,939	4,055	2,647	4,397	3,257	2,832	3,694	3,205	3,233	6	1,066	1,980	2,010	2,785	2,549	2,118	1,475	2,286	2,052	2,189	1,991	2,211	1,956	2,300	2,294	2,981	2,645	
Zinfandel	2,499	3,120	2,509	3,061	2,721	3,131	2,913	3,140	3,524	1,514	2,892	1,773	2,110	2,009	1,722	1,859	1,580	1,914	1,972	1,758	1,722	1,531	1,687	1,463	1,367	1,134	1,052	
Hectarines	187	217	183	294	200	359	223	253	360	273	523	385	452	526	477	590	505	422	590	414	684	910	602	1,363	915	1,419	1,539	
Peaches																												
Clingstone	443	90	117	73	117	67	64	25	47	20	55	29	46	25	10	59	46	28	43	43	39	58	25	--	--	--	--	
Freestone	944	693	1,472	1,433	1,526	1,470	1,307	1,228	2,061	3,392	3,655	2,874	3,779	3,158	3,292	3,340	4,501	3,700	4,207	3,590	3,524	4,880	2,919	3,432	2,112	1,842	2,435	
Unclassified	650	279	319	525	334	619	521	147	41	37	25	23	31	29	20	--	--	--	--	--	--	--	--	--	--	--	--	
Pears																												
Anjou	49	12	37	6	8	1	2	--	3	20	9	9	24	23	46	32	29	52	40	41	44	19	38	26	7	24	15	
Bartlett	4,495	3,232	3,077	4,702	4,221	3,462	3,466	2,799	2,737	4,880	2,944	5,909	4,192	4,037	3,196	5,407	3,740	3,511	5,188	2,893	3,058	2,796	3,564	3,844	3,232	3,555	2,916	
Buerre Boe	328	60	140	139	222	135	54	14	116	195	144	161	205	182	31	101	199	158	172	125	200	97	200	199	228	211	144	
Buerre Hardy	260	173	202	138	270	319	445	3	9	149	88	161	79	112	8	26	--	--	--	--	--	--	--	--	--	--	--	--
Comice	140	31	66	30	120	80	157	53	123	157	118	182	192	284	99	240	116	168	107	175	203	171	128	172	52	77	90	
Winter Buerre	2	--	3	--	25	20	29	20	12	22	33	40	43	8	7	22	4	2	4	--	4	--	3	b/	b/	b/	b/	
Winter Wells	19	5	40	2	24	--	1	10	3	36	19	91	305	37	64	112	64	77	27	35	89	31	31	47	20	41	5	
Other	467	312	594	320	826	233	281	94	57	100	191	167	166	402	66	64	37	48	51	32	41	12	46	33	46	19	10	
Plums	3,949	2,810	3,969	3,590	3,565	3,673	3,837	3,866	3,652	4,019	4,988	3,570	5,484	4,129	3,744	4,149	4,113	4,763	2,614	4,132	3,279	4,193	4,616	3,727	2,646	3,987	3,539	

b/ Dashes indicate data not reported.

b/ Variety no longer indicated separately.

Sources: U. S. Agricultural Marketing Service, Interstate Passings of California Deciduous Tree Fruit and Grapes (San Francisco, various issues). 1948-1960, issue of January 11, 1961; 1937-1947, issue of January 27, 1950; 1934-1936, issue of January 8, 1945.

Appendix Table A.5
Interstate Shipments of Selected Varieties of California Plums, 1935-1960^{b/}

Variety	1935	1936	1937	1939	1940	1941	1942	1943	1944	1945	1946	1947	1948	1949	1950	1951	1952	1953	1954	1955	1956	1957	1958	1959	1960
	carlots																								
Ace ^{b/}														28	50	48	29	52	61	78	94	118	61	101	98
Beauty	353	402	555	427	307	510	465	649	635	493	624	892	323	545	371	522	342	559	563	651	694	633	598	573	442
Burbank	194	197	150	136	162	152	148	139	170	79	151	120	159	111	84	97	87	82	62	91	71	67	46	41	40
Duarte	216	317	153	366	542	552	441	350	622	363	552	458	701	420	530	659	371	498	259	550	612	570	338	421	597
Late Duarte ^{c/}												151	152	240	221	253	142	201	87	135	213	209	110	142	207
Diamond	70	125	52	27	60	44	39	36	62	40	57	43	20	26	21	18	20	16	7	16	12	14	4	11	7
El Dorado ^{b/}					29	21	41	24	36	26	48	43	41	49	55	75	59	66	58	124	174	184	154	339	396
Giant	100	115	145	80	99	121	84	140	95	138	128	112	82	48	71	54	60	42	44	29	23	26	19	20	13
Kelsey	121	215	167	144	197	187	191	200	177	106	268	110	221	138	123	134	60	138	109	123	137	127	82	110	72
President	167	321	281	161	302	416	362	320	423	366	409	404	212	292	350	380	339	323	189	407	375	367	145	354	300
Santa Rosa	291	779	705	808	953	911	1,172	1,206	1,276	1,293	1,703	1,294	1,019	1,734	1,519	1,989	677	1,605	1,445	1,648	1,936	1,397	1,282	1,808	1,464
Late Santa Rosa ^{c/}												116	51	36	136	168	20	161	260	202	329	235	90	329	224
Tragedy	237	198	149	168	226	144	167	138	234	147	175	125	99	97	143	84	72	85	66	81	97	72	50	58	53
Late Tragedy ^{c/}												35	38	23	37	101	84	79	91	55	110	107	54	112	85
Wickson	150	330	366	237	304	189	218	229	251	181	284	180	175	150	158	159	82	139	91	151	112	108	61	89	62

^{a/} Data for 1938 not available.

^{b/} Not reported separately prior to first year in which shipments indicated.

^{c/} Included with regular variety until year in which separated.

Sources: California Tree Fruit Agreement, Annual Report, 1948 (Sacramento, 1948), Table 2.

Ibid., 1960, Table 2.

Appendix Table A-6

Estimated Per Capita Disappearance, Fresh and Total, Selected Deciduous Fruits in Farm Weights, 1924-1959

Year	Apples		Apricots		Cherries		Grapes (all varieties)		Nectar- rines	Freestone peaches		Pears		Plums and prunes	
	Fresh	Total	Fresh	Total	Fresh	Total	Fresh	Total	Fresh	Total	Total ¹	Fresh	Total	Fresh	Total
	1	2	3	4a	5	6a	7	8a	9	10	11 ²	12	13a	14	15a ³
pounds per capita															
1924	53.4	56.0	0.2	1.5	1.8	--g	8.8	28.4	--g	16.1	19.1	6.3	7.2	2.1	2.2
1925	45.6	48.7	0.2	1.5	1.8	--	8.2	30.8	--	12.4	14.6	5.9	7.2	2.4	2.5
1926	61.4	64.0	0.2	1.9	2.4	--	9.6	35.0	--	17.6	20.6	7.7	9.0	3.1	3.6
1927	36.9	39.3	0.3	2.2	1.3	--	8.9	34.4	--	10.8	11.7	5.4	6.6	2.8	2.9
1928	48.3	50.6	0.3	1.6	1.7	--	10.8	33.9	--	16.0	18.3	6.7	8.3	3.3	3.4
1929	39.2	42.2	0.4	2.5	1.3	--	9.0	29.7	--	12.7	14.3	5.7	7.5	2.5	2.6
1930	41.5	44.6	0.4	1.8	1.2	--	8.6	33.5	--	10.0	12.1	6.6	8.0	3.7	3.8
1931	50.9	53.0	0.5	2.6	1.4	--	8.3	22.3	--	21.0	22.6	7.1	7.9	2.7	2.8
1932	38.6	40.5	0.5	2.5	1.6	--	7.7	29.4	--	8.7	10.5	5.2	6.3	2.8	2.9
1933	39.5	41.5	0.3	2.5	1.4	--	6.8	27.6	--	9.6	11.4	5.1	6.4	2.3	2.4
1934	24.9	27.2	0.4	1.6	1.2	2.1	7.3	27.8	--	10.8	12.7	6.7	8.8	2.9	3.0
1935	32.5	35.0	0.4	2.1	1.1	2.2	7.2	35.1	--	14.2	15.6	6.1	7.7	2.5	2.6
1936	27.2	30.0	0.4	2.5	1.0	1.8	6.3	25.8	0.1	10.5	12.3	5.9	8.3	2.6	2.7
1937	33.1	36.2	0.5	3.4	1.0	2.2	7.3	37.2	0.1	13.8	15.9	6.6	8.8	2.6	2.7
1938	27.8	30.7	0.5	1.3	1.0	1.9	5.5	35.0	0.1	12.6	14.1	6.3	8.3	2.6	2.7
1939	30.3	33.0	0.5	3.3	1.1	2.7	6.0	33.0	0.2	14.7	17.0	6.4	8.8	2.7	2.8
1940	29.2	33.0	0.4	1.7	1.0	2.5	6.2	34.0	0.1	12.7	15.2	7.0	10.4	2.5	2.5
1941	31.2	34.5	0.4	2.6	1.1	2.4	6.2	37.6	0.1	18.2	20.9	6.3	10.2	2.3	2.4
1942	27.7	30.9	0.5	3.0	1.1	2.8	6.1	31.5	0.2	14.2	17.0	6.6	11.0	2.4	2.4
1943	24.6	27.8	0.5	1.0	0.9	1.7	5.6	41.4	0.2	8.0	9.6	5.4	8.9	2.1	2.3
1944	25.2	28.5	0.9	4.6	1.2	3.0	4.8	35.8	0.2	17.4	19.8	7.0	11.4	2.7	3.0
1945	22.6	26.3	0.7	2.6	1.1	2.2	5.4	38.6	0.2	17.8	21.5	7.2	11.6	2.3	2.5
1946	22.7	27.6	0.7	4.2	1.0	3.2	5.7	42.8	0.2	16.3	19.0	6.7	10.8	2.7	2.9
1947	25.0	28.7	0.6	2.5	0.9	2.4	6.6	34.0	0.2	14.4	17.5	5.8	11.0	2.2	2.3
1948	25.9	30.8	0.5	2.6	0.8	2.9	5.8	37.8	0.2	11.0	12.7	4.4	8.3	2.1	2.2
1949	24.7	29.9	0.6	2.2	1.1	3.2	5.2	30.3	0.2	11.5	13.9	6.0	10.3	2.4	2.5
1950	22.9	29.0	0.3	2.6	0.8	3.2	5.4	42.3	0.2	7.8	9.5	4.5	9.2	1.8	1.8
1951	25.4	31.0	0.4	2.2	0.7	2.9	5.8	39.9	0.1	9.1	11.8	4.5	9.4	2.3	2.4
1952	21.1	27.5	0.4	2.1	0.8	2.8	5.7	35.2	0.2	10.5	13.0	5.1	9.5	1.7	1.8
1953	20.1	26.6 ⁴	0.4	2.7	0.7	2.9	5.1	30.9	0.2	10.0	12.4	4.7	8.6	2.0	2.2
1954	20.1	26.2	0.3	1.8	0.7	2.6	5.1	29.8	0.2	9.9	12.6	3.7	8.5	1.4	1.5
1955	20.0	26.5	0.4	3.2	0.8	3.2	5.0	35.1	0.3	5.9	7.8	3.4	8.2	1.9	2.0
1956	19.3	26.3	0.2	2.1	0.5	2.1	4.8	31.7	0.2	9.0	12.1	3.8	8.8	1.9	2.0
1957	19.3	25.7	0.3	1.9	0.6	2.9	4.0	26.6	0.4	8.4	10.9	4.1	8.1	1.6	1.7
1958	22.5	29.8	0.2	1.2	0.5	2.3	4.1	33.4	0.4	10.5	13.6	3.8	7.6	1.2	1.3
1959	21.9	29.3	0.3	--	0.4	--	3.9	--	0.4	9.7	--	3.9	--	1.6	1.7

a/ Total consumption equals production of value minus exports plus imports divided by the number eating out of civilian supplies as of July 1 for each year for years 1940-1959. Prior to 1940, total population figures were used.

b/ Per-capita fresh consumption of freestone peaches equals per-capita fresh consumption of all peaches minus fresh sales of clingpeaches divided by number eating out of civilian supplies as of July 1 each year.

c/ Per-capita total consumption of freestone peaches equals (production of value of all peaches minus production of value of California clingstone peaches minus fresh and dried exports) divided by number eating out of civilian supplies as of July 1 each year (1940-1959). Total population, including those in armed forces, used prior to 1940.

To convert production of value figures from bushels to pounds, 1 bushel equals 48 pounds. This was done to figure per-capita total consumption of apples, freestone peaches, and pears.

d/ Includes plums and prunes other than dried. Estimated by dividing amount of California plums sold by fresh sales of California plums, then multiplying these ratios by per-capita fresh consumption of plums and prunes.

e/ Dashes indicate no data available.

Sources:

Cols. 1-8 and 10-15: For the years 1924 through 1953 (except for nectarines)--Sidney Hoot and Varden Fuller, Trends and Prospects: Deciduous Fresh Fruits, University of California, Giannini Foundation Mimeographed Report No. 176 (Berkeley, April, 1955), Table V, pp. 106-107.

Cols. 1-3, 5, 7, 9, 10, 12, and 14: For the years after 1954--U. S. Agricultural Marketing Service, Consumption of Food in the United States, 1902-52, Agricultural Handbook No. 62, Supplement for 1956, pp. 16 and 21; and Supplement for 1959, pp. 4 and 6.

Cols. 4, 6, 8, 11, 13, and 15: For the years after 1953--U. S. Department of Agriculture, Agricultural Statistics, 1960, pp. 164, 167, 182, 186, 190, 195, and 578.

For fresh sales of California clingstone peaches and plums for 1954 and 1955, see California Crop Livestock Reporting Service, Fruit and Nut Crops, 1909-1955: Acreage, Production, Utilization, Value (Sacramento, 1956), pp. 75 and 96.

For fresh sales of California clingstone peaches and plums for 1956, see California Crop and Livestock Reporting Service, California Fruit and Nut Crops (Sacramento, May 1, 1960), p. 4.

For 1957-1959, ibid., May 1, 1961, p. 4.

Appendix Table A-7

Sales--Total, Fresh, and Processed--Selected California Deciduous Fruits, 1924-1960
(Fresh weight basis)

Year	Apples ^{a/b}				Apricots			
	Total sold (all uses)	Sold for fresh use	Fresh use as percent- age of total sold	Process- ing as percent- age of total sold	Total sold (all uses)	Sold for fresh use	Fresh use as percent- age of total sold	Process- ing as percent- age of total sold
	1,000 tons		per cent	1,000 tons	per cent	1,000 tons	per cent	1,000 tons
1924					134.5	11.5	8.6	123.0
1925					147.4	10.8	7.3	136.6
1926					171.4	9.2	5.4	162.2
1927					204.3	12.8	6.3	191.5
1928					171.3	13.3	7.8	158.0
1929					210.1	15.4	7.3	194.7
1930					183.3	16.8	9.2	166.5
1931					267.7	24.2	5.0	243.5
1932					250.7	23.9	9.5	226.8
1933					266.1	16.2	6.1	249.9
1934	136.8	67.3	49.2	69.5	137.3	12.0	8.7	125.3
1935	211.4	101.4	48.0	110.0	214.3	14.8	6.9	199.5
1936	190.1	99.2	52.2	90.9	246.3	16.4	6.7	229.9
1937	207.7	111.4	53.6	96.3	309.3	19.3	6.2	290.0
1938	171.2	102.0	59.6	69.2	164.3	18.6	11.3	145.7
1939	173.3	86.3	49.8	91.0	302.3	21.1	7.0	281.2
1940	138.9	80.6	58.0	58.3	101.3	13.0	12.8	88.3
1941	175.1	85.0	48.5	90.1	196.3	15.7	8.0	180.6
1942	140.8	68.8	48.9	72.0	197.3	17.9	9.1	179.4
1943	206.1	103.6	50.3	108.5	49.7	16.2	20.7	62.1
1944	144.8	68.2	47.1	76.6	322.2	34.6	10.7	287.6
1945	250.9	104.9	41.8	146.0	157.3	23.6	15.0	133.7
1946	180.9	79.9	44.2	101.0	304.3	26.1	8.6	278.2
1947	236.3	124.2	52.6	112.1	167.3	20.7	12.4	146.6
1948	138.2	63.9	46.2	74.3	191.3	20.9	10.9	170.4
1949	224.0	101.2	45.2	122.8	158.3	19.9	12.6	138.4
1950	159.3	77.6	48.7	81.7	211.3	25.8	12.2	185.5
1951	185.3	89.5	48.3	95.8	170.3	20.3	11.9	150.0
1952	218.1	104.4	47.9	113.7	156.3	17.4	10.8	138.9
1953	170.1	66.1	38.9	104.0	61.1	22.8	17.8	210.5
1954	226.3	76.4	33.8	149.9	138.3	12.6	9.1	125.7
1955	223.9	82.3	36.8	141.6	251.3	15.8	6.3	235.5
1956	219.8	81.3	37.9	136.5	184.3	11.3	6.1	173.0
1957	212.4	73.2	34.5	139.2	65.5	16.3	6.8	154.1
1958	229.2	91.7	40.0	137.5	88.3	5.7	6.5	82.6
1959	259.2	72.0	27.8	187.2	206.3	10.5	5.0	197.8
1960	\$/	\$/	\$/	\$/	223.8	11.3	5.0	212.5

Cherries

Grapes (all varieties)

Year	Total sold (all uses)	Sold for fresh use	Fresh use as percent- age of total sold	Process- ing as percent- age of total sold	Total sold (all uses)	Sold for fresh use	Fresh use as percent- age of total sold	Process- ing as percent- age of total sold
1924	13.0	9.2	70.8	3.8	29.2	1,528.2	801.9	52.5
1925	11.6	6.8	58.6	4.8	41.4	1,905.4	999.2	51.9
1926	19.5	9.7	49.7	5.8	50.3	2,047.6	904.6	44.2
1927	11.6	7.4	63.8	4.2	56.2	2,257.9	1,052.6	46.6
1928	16.2	10.2	63.0	6.0	37.0	2,207.1	1,041.5	47.2
1929	15.8	8.0	50.6	7.8	49.4	1,821.3	873.1	47.9
1930	17.6	9.2	52.3	8.4	47.7	2,058.4	883.1	46.9
1931	19.5	12.6	64.6	6.7	34.4	1,304.6	567.3	43.5
1932	16.5	10.2	61.8	6.3	38.2	1,766.7	605.2	34.3
1933	24.4	12.4	50.8	12.0	49.2	1,653.3	415.3	25.1
1934	16.6	9.6	57.8	7.0	42.2	1,696.4	469.0	27.6
1935	14.7	7.5	51.0	7.2	49.0	2,190.5	469.1	22.1
1936	22.8	11.7	51.3	11.1	48.7	1,710.5	479.7	28.0
1937	21.4	10.8	50.5	10.6	49.5	2,450.5	538.0	22.0
1938	24.9	14.1	56.6	10.8	43.4	2,527.2	491.7	19.5
1939	32.7	15.6	47.7	17.1	52.3	2,224.6	513.0	23.1
1940	10.7	6.9	64.5	3.8	35.5	2,246.7	550.8	24.5
1941	20.7	12.0	58.0	8.7	42.0	2,543.7	565.7	22.2
1942	27.7	15.4	55.6	12.3	44.4	2,156.7	519.2	24.1
1943	15.7	10.1	64.3	5.6	45.7	2,786.1	377.5	13.5
1944	27.5	15.9	57.8	10.8	40.4	2,511.3	401.3	16.0
1945	37.7	16.0	42.4	21.7	57.6	2,648.3	498.1	18.8
1946	33.7	14.5	43.0	19.2	57.0	2,955.3	516.7	17.5
1947	27.7	13.8	49.8	13.9	50.2	2,833.3	619.2	21.9
1948	23.2	7.7	33.2	15.5	62.8	2,888.1	441.8	15.3
1949	43.7	17.2	39.4	26.5	60.6	2,462.3	512.2	20.8
1950	30.7	17.0	55.4	13.7	44.6	2,429.3	489.4	20.1
1951	19.5	8.8	45.1	10.7	54.9	3,126.3	378.2	18.0
1952	39.2	16.8	42.9	22.4	59.5	3,955.3	577.4	19.5
1953	26.7	13.6	50.9	13.1	49.1	2,470.3	497.9	20.2
1954	22.9	10.4	45.4	12.5	54.6	2,324.3	515.6	22.2
1955	33.7	15.2	45.1	18.5	54.9	3,013.3	367.9	18.8
1956	34.0	19.5	57.3	16.2	59.1	2,686.3	513.1	19.5
1957	30.7	11.0	35.9	19.6	64.1	2,379.3	494.2	20.8
1958	11.9	5.5	46.2	6.4	53.8	2,738.3	500.7	18.3
1959	13.2	6.1	46.2	7.1	53.8	2,854.3	528.7	18.5
1960	23.2	8.7	37.5	14.5	62.5	2,691.6	522.9	19.4

(Continued on next page.)

Appendix Table A.7--continued.

Year	Nectarines ^a					Freestone peaches				
	Total solid (all uses)	Sold for fresh use	Fresh use as percent- age of total solid	Sold for process- ing	Process- ing as percent- age of total solid	Total solid (all uses)	Sold for fresh use	Fresh use as percent- age of total solid	Sold for process- ing	Process- ing as percent- age of total solid
	1,000 tons	per cent	1,000 tons	per cent	1,000 tons	per cent	1,000 tons	per cent	1,000 tons	per cent
1924						203.6	34.4	16.9	169.2	83.1
1925						167.8	43.0	25.6	124.8	74.4
1926						222.2	34.1	15.3	188.1	84.7
1927						171.5	61.0	35.6	110.5	64.4
1928						214.7	41.9	19.5	172.8	80.5
1929						151.5	44.1	28.7	109.4	71.3
1930						265.3	92.9	35.0	172.4	65.0
1931						200.5	64.5	32.2	136.0	67.8
1932						207.7	65.2	31.4	142.5	68.6
1933						158.8	53.9	27.1	144.9	72.9
1934						189.0	48.9	25.9	140.1	74.1
1935						155.0	44.1	28.5	110.9	71.5
1936	9.6	5.8	60.4	3.8	39.6	198.0	56.8	29.6	135.2	70.4
1937	10.9	8.4	77.1	2.5	22.9	204.0	62.2	30.5	141.8	69.5
1938	9.9	7.3	73.7	2.6	26.3	195.0	66.8	34.3	128.2	65.7
1939	13.3	10.5	78.9	2.8	21.1	229.0	77.5	33.8	151.5	66.2
1940	8.3	7.0	84.3	1.3	15.7	230.0	79.8	34.7	150.2	65.3
1941	9.4	7.5	79.8	1.9	20.2	225.0	83.1	36.9	141.9	63.1
1942	12.3	9.7	78.9	2.6	21.1	263.0	103.2	39.2	159.8	60.8
1943	13.3	10.5	85.7	1.7	14.3	247.0	124.8	50.5	122.2	49.5
1944	16.9	13.8	81.7	3.1	18.3	322.0	140.4	43.6	181.6	56.4
1945	12.9	10.1	78.3	2.8	21.7	272.0	107.9	39.7	164.1	60.3
1946	15.9	13.1	82.4	2.6	17.4	334.0	134.5	40.3	199.5	59.7
1947	14.9	13.2	88.6	1.7	11.4	271.0	117.3	43.3	153.7	56.7
1948	12.6	12.2	96.8	.4	3.2	218.0	113.6	52.1	104.4	47.9
1949	16.5	15.6	94.5	.9	5.5	253.0	111.3	44.0	141.7	56.0
1950	12.3	11.7	95.1	.6	4.9	228.0	118.1	51.8	109.9	48.2
1951	11.8	11.4	96.6	.4	3.4	260.0	106.4	40.9	153.6	59.1
1952	14.8	14.3	96.6	.5	3.4	258.0	119.7	46.4	138.3	53.6
1953	12.8	12.1	94.5	.7	5.5	245.0	105.6	42.9	140.4	57.1
1954	18.6	17.9	96.2	.7	3.8	276.0	117.0	42.4	159.0	57.6
1955	23.8	23.1	97.1	.7	2.9	272.0	127.6	46.9	144.4	53.1
1956	18.8	18.4	97.9	.4	2.1	301.0	109.7	36.4	191.3	63.6
1957	35.8	35.2	98.3	.6	1.7	289.8	123.4	42.6	166.4	57.4
1958	30.8	29.2	94.8	1.6	5.2	276.8	105.7	38.2	171.1	61.8
1959	38.8	37.6	96.9	1.2	3.1	320.8	111.7	34.8	209.1	65.2
1960	43.8	43.0	98.2	.8	1.8	296.8	117.4	39.6	179.4	60.4

Pears (Bartlett)					Pears (other than Bartlett)					
Year	Total solid (all uses)	Sold for fresh use	Fresh use as percent- age of total solid	Sold for process- ing	Process- ing as percent- age of total solid	Total solid (all uses)	Sold for fresh use	Fresh use as percent- age of total solid	Sold for process- ing	Process- ing as percent- age of total solid
Year	1,000 tons	per cent	1,000 tons	per cent	1,000 tons	per cent	1,000 tons	per cent	1,000 tons	per cent
1924	117.8	63.5	53.9	54.3	46.1	12.8	12.8	100.0		
1925	166.7	89.4	53.6	77.3	46.4	11.8	11.8	100.0		
1926	185.7	111.3	59.9	74.4	40.1	15.8	15.8	100.0		
1927	159.9	91.9	57.5	68.0	42.5	16.8	16.8	100.0		
1928	200.0	107.9	54.0	92.1	46.0	21.8	21.8	100.0		
1929	171.2	92.8	54.2	78.4	45.8	16.7	16.7	100.0		
1930	209.2	135.1	64.6	74.1	35.4	30.8	30.8	100.0		
1931	177.5	105.9	59.7	71.6	40.3	24.8	24.8	100.0		
1932	156.5	89.2	57.0	67.3	43.0	22.8	22.8	100.0		
1933	157.6	68.6	43.5	89.0	56.8	22.8	22.8	100.0		
1934	192.7	95.5	49.6	97.2	50.4	30.8	30.8	100.0		
1935	145.8	76.2	52.3	69.6	47.7	17.8	17.4	97.8	.4	2.2
1936	208.9	105.0	43.1	118.9	56.9	30.8	30.1	97.7	.7	2.3
1937	189.9	94.6	49.8	95.3	50.2	23.8	23.3	97.9	.5	2.1
1938	218.9	113.0	51.6	105.9	48.4	45.8	45.8	100.0		
1939	216.9	86.7	40.0	130.2	60.0	29.8	29.8	100.0		
1940	181.9	80.7	43.9	103.2	56.1	31.8	31.3	97.0	10.5	33.0
1941	204.9	77.1	38.7	133.8	65.3	16.8	21.3	67.5	10.5	62.5
1942	208.9	66.6	31.9	142.3	68.1	21.8	16.6	76.2	11.2	51.4
1943	264.9	109.3	41.3	155.6	58.7	29.8	17.2	57.7	12.6	42.3
1944	215.9	81.7	37.8	134.2	62.2	29.8	15.5	52.0	14.3	48.0
1945	289.9	137.1	47.3	148.8	51.4	45.8	24.9	54.4	20.9	45.6
1946	266.9	104.0	39.0	162.9	61.0	41.8	21.9	52.4	19.9	47.6
1947	294.9	101.4	34.4	193.5	65.6	48.8	27.2	55.7	21.6	44.3
1948	224.9	42.9	19.1	182.0	80.9	29.8	10.1	33.9	19.7	66.1
1949	301.0	117.1	38.9	183.9	61.1	16.8	16.6	98.8	24.2	59.3
1950	290.0	85.5	29.0	204.5	70.5	39.8	9.5	23.9	26.3	73.5
1951	301.0	80.5	26.6	222.5	73.4	47.8	16.6	34.7	31.2	65.3
1952	334.0	114.6	34.3	219.4	65.7	35.8	11.1	31.0	24.7	69.0
1953	238.0	69.4	29.2	168.6	70.8	43.8	12.0	27.4	31.8	72.6
1954	357.0	93.1	26.1	263.9	74.2	43.8	16.8	38.4	27.0	61.6
1955	308.0	68.4	22.2	239.6	77.8	37.8	13.7	36.2	24.1	63.8
1956	374.0	86.0	23.0	288.0	77.0	49.8	22.1	44.4	27.7	55.6
1957	359.0	94.1	26.2	264.9	73.8	42.8	21.1	49.3	21.7	50.7
1958	313.1	81.4	26.6	231.7	74.3	32.8	10.1	30.8	22.7	69.2
1959	365.2	88.9	24.3	276.3	75.7	36.8	18.4	47.4	20.4	56.2
1960	330.2	76.0	23.0	254.2	77.0	31.8	12.8	40.3	19.0	59.7

(Continued on next page.)

Appendix Table A.7--continued.

Year	Plums				
	Total sold (all uses)	Sold for fresh use	Fresh use as percent- age of total sold	Sold for process- ing	Process- ing as percent- age of total sold
	1,000 tons	1,000 tons	per cent	1,000 tons	per cent
1924	41.8	40.3	96.4	1.5	3.6
1925	53.8	50.8	94.4	3.0	5.6
1926	73.8	70.0	94.9	3.8	5.1
1927	57.8	55.5	96.0	2.3	4.0
1928	66.8	63.9	95.7	2.9	4.3
1929	39.8	37.8	95.0	2.0	5.0
1930	81.8	78.7	96.2	3.1	3.8
1931	57.7	56.2	97.4	1.5	2.6
1932	57.7	56.5	97.9	1.2	2.1
1933	49.7	47.9	96.4	1.8	3.6
1934	61.7	59.9	97.1	1.8	2.9
1935	47.7	45.6	95.6	2.1	4.4
1936	63.7	62.4	98.0	1.3	2.0
1937	65.7	62.7	95.4	3.0	4.6
1938	62.7	61.7	98.4	1.0	1.6
1939	63.7	62.3	97.8	1.4	2.2
1940	63.7	62.8	98.6	.9	1.4
1941	65.7	64.0	97.4	1.7	2.6
1942	65.7	64.7	98.5	1.0	1.5
1943	75.7	68.4	90.4	7.3	9.6
1944	89.7	82.0	91.4	7.7	8.6
1945	69.7	63.5	91.1	6.2	8.9
1946	99.7	92.0	92.3	7.7	7.7
1947	73.7	70.9	96.2	2.8	3.8
1948	66.7	65.1	97.6	1.6	2.4
1949	79.7	77.5	97.2	2.2	2.8
1950	74.7	73.1	97.9	1.6	2.1
1951	93.7	91.0	97.1	2.7	2.9
1952	52.7	50.6	96.0	2.1	4.0
1953	76.7	75.0	97.8	1.7	2.2
1954	66.7	64.2	96.3	2.5	3.7
1955	83.7	80.5	96.2	3.2	3.8
1956	95.7	91.8	95.9	3.9	4.1
1957	77.7	75.1	96.7	2.6	3.3
1958	60.7	56.7	93.4	4.0	6.6
1959	89.7	85.3	95.1	4.4	4.9
1960	79.8	76.8	96.2	3.0	3.8

a/ Apple data not available prior to 1934.

b/ Bushels converted to tons by multiplying by .024. One bushel equals 48 pounds.

c/ Apple data not available for 1960.

d/ Nectarine data not available prior to 1936.

e/ Blanks indicate pear data--other than Bartlett--not available prior to 1935.

Sources:

All years prior to 1956: California Crop and Livestock Reporting Service, California Fruit and Nut Crops, 1909-1955: Acreage, Production, Utilization, Value, Special Publication No. 261 (Sacramento, July, 1956), pp. 14, 18, 24, 35, 79, 86, 89, and 96.

Years from 1956 through 1960: California Crop and Livestock Reporting Service, California Fruit and Nut Crops (Sacramento, May 1, 1960), pp. 3-5 and May 1, 1961, pp. 3-5.

Years from 1956 through 1959 (apples only): U. S. Agricultural Marketing Service, Interstate Shipments of California Deciduous Tree Fruits, 1960 (San Francisco, 1961), p. 10.

Appendix Table A.8

Sales—Total Fresh, Out of State, and Within the State—Selected California Deciduous Fruits, 1924-1960
(Fresh weight basis)

Year	Apples ^{1/2}					Apricots				
	Total sold for fresh use	Shipped out-of- state	Out of state as a per- centage of total fresh use		Within the state as a per- centage of total fresh use	Total sold for fresh use	Shipped out-of- state	Out of state as a per- centage of total fresh use		Within the state as a per- centage of total fresh use
			1,000 tons	per cent				1,000 tons	per cent	
1924	107.3					11.5	6.1	53.0	5.4	47.0
1925	79.0					10.8	4.8	44.4	6.0	55.6
1926	147.5					9.2	3.2	34.8	6.0	65.2
1927	111.7					12.8	5.6	43.8	7.2	56.2
1928	161.7					13.3	4.8	36.1	8.5	63.9
1929	105.9					15.4	5.4	35.1	10.0	64.9
1930	156.5					16.8	7.4	44.0	9.4	56.0
1931	111.5					24.2	12.4	51.2	11.8	48.8
1932	120.4					23.9	11.8	49.4	12.1	50.6
1933	91.9					16.2	7.0	43.2	9.2	56.8
1934	67.3	14.4	21.4	52.9	78.6	12.0	4.3	35.8	7.7	64.2
1935	101.4	30.7	30.3	70.7	69.7	14.8	5.0	33.8	9.8	66.2
1936	99.2	28.5	28.7	70.7	71.3	16.4	6.7	40.9	9.7	59.1
1937	111.4	27.8	25.0	83.4	75.0	19.3	7.3	37.6	9.5	60.5
1938	102.0	20.1	19.7	81.9	80.3	18.6	5.6	30.1	13.0	69.9
1939	86.3	16.9	19.6	69.4	80.4	21.1	7.6	36.0	13.5	64.0
1940	80.6	8.9	11.0	71.7	89.0	13.0	4.3	33.1	8.7	66.9
1941	85.0	16.1	18.9	68.9	81.1	16.2	6.2	39.5	9.5	60.5
1942	68.8	10.1	14.7	58.7	85.3	17.9	5.5	30.7	12.4	67.3
1943	103.6	29.2	28.2	74.4	71.8	16.2	5.2	32.1	12.0	69.9
1944	68.2	23.5	34.5	44.7	65.5	34.6	13.5	39.0	21.1	61.0
1945	104.9	68.7	59.8	42.2	40.2	23.6	12.1	51.3	11.5	48.7
1946	79.9	29.7	56.2	70.3	66.1	19.3	13.5	48.5	13.6	51.9
1947	124.2	37.6	30.3	86.6	69.7	20.7	9.9	47.8	10.8	52.2
1948	63.9	13.9	21.8	50.0	78.2	20.9	8.1	38.8	12.8	61.2
1949	101.2	17.6	17.4	83.6	82.6	19.9	7.7	38.7	12.2	61.3
1950	77.6	13.9	17.9	63.7	82.1	17.5	12.7	51.2	12.6	53.4
1951	89.5	15.4	17.2	74.1	82.8	20.3	8.0	39.4	12.3	60.6
1952	104.4	25.0	23.9	79.4	76.1	17.4	7.6	43.7	9.8	56.3
1953	66.1	15.2	23.0	50.9	71.0	17.8	8.7	48.9	9.1	51.1
1954	76.4	8.3	19.4	61.6	80.6	12.6	6.4	40.8	6.8	52.6
1955	82.3	16.1	19.6	66.2	80.4	15.8	8.6	54.4	7.2	45.6
1956	83.3	7.9	9.5	75.4	90.5	11.3	5.4	47.8	5.9	52.2
1957	73.2	18.0	24.6	55.2	75.4	11.2	5.0	44.6	6.2	55.4
1958	93.7	10.8	11.8	80.5	88.2	5.7	1.7	29.8	4.4	70.2
1959	72.0	10.0	13.9	62.0	86.1	10.3	3.6	34.4	6.9	65.7
1960	g/	g/	g/	g/	g/	11.3	4.9	43.4	6.4	56.6

Cherries					Grapes (all varieties)				
1924	9.2	5.7	62.0	3.5	38.0	801.9	726.6	90.6	75.3
1925	6.8	4.4	60.3	2.7	39.7	989.2	910.0	92.0	79.2
1926	9.7	5.9	61.3	3.8	39.2	904.6	821.0	90.8	83.6
1927	7.4	4.6	62.2	2.7	37.8	1,052.6	965.0	91.7	87.6
1928	10.2	7.1	69.6	3.1	30.4	1,041.5	954.0	91.6	87.5
1929	8.0	4.8	60.0	3.2	40.0	873.1	788.0	90.3	85.1
1930	9.2	6.2	67.4	3.0	32.6	883.1	781.3	88.5	101.8
1931	12.8	8.3	64.8	3.5	35.2	867.3	755.2	87.1	93.8
1932	10.2	5.8	57.9	4.4	34.1	605.2	506.0	83.6	99.2
1933	12.4	6.8	54.8	5.6	45.2	445.3	348.1	83.8	67.2
1934	9.6	6.3	65.6	3.3	34.4	469.0	403.1	85.9	65.9
1935	7.5	4.5	60.0	4.0	38.1	427.5	368.4	86.2	57.6
1936	11.7	7.1	60.7	4.6	39.3	479.7	420.4	87.6	59.3
1937	10.8	5.8	53.7	5.0	46.3	538.0	484.1	90.0	53.9
1938	14.1	6.9	48.9	7.2	51.1	491.7	430.2	87.5	61.5
1939	15.6	7.1	45.5	5.4	51.0	450.8	394.8	87.9	62.8
1940	6.9	3.5	50.7	3.4	49.3	550.8	487.2	88.5	63.6
1941	12.0	5.5	45.8	6.5	54.2	565.7	509.5	90.1	56.2
1942	15.4	8.3	53.9	7.1	46.1	519.2	468.0	90.1	51.2
1943	10.1	5.3	52.5	5.8	51.5	336.3	291.8	86.8	40.9
1944	15.9	8.2	51.6	7.7	48.4	401.3	365.2	91.0	36.1
1945	16.0	9.8	61.2	6.2	38.8	498.1	442.2	88.8	55.9
1946	14.5	9.2	63.4	5.3	36.6	516.7	461.9	89.4	54.8
1947	13.8	7.7	55.8	5.1	37.0	531.4	481.2	90.6	48.1
1948	7.7	5.0	64.9	2.7	35.1	513.8	470.6	86.5	73.2
1949	17.2	8.8	51.2	8.4	48.8	512.2	450.2	87.9	62.0
1950	17.0	11.4	67.1	5.6	32.9	469.4	433.0	88.5	56.4
1951	8.8	6.1	69.3	3.2	37.1	507.1	471.7	87.1	71.3
1952	16.8	10.4	61.9	6.4	38.1	577.4	512.0	88.7	65.4
1953	13.6	9.4	69.1	4.2	30.9	479.9	433.7	87.1	62.9
1954	10.4	7.3	70.2	3.1	29.8	535.6	455.0	86.2	60.6
1955	15.2	10.8	71.1	28.9	4.5	457.9	495.9	87.3	72.0
1956	16.9	10.4	69.8	4.5	30.2	513.1	445.9	87.9	67.2
1957	11.0	7.1	64.5	3.9	35.5	494.2	477.2	86.4	67.0
1958	6.3	3.8	60.3	2.5	39.7	500.8	431.2	86.1	69.6
1959	7.2	4.7	65.3	2.5	34.7	529.0	457.1	86.4	71.9
1960	8.7	5.4	62.1	3.3	37.9	522.9	448.6	85.8	74.3

(Continued on next page.)

Appendix Table A.8--continued.

Year	Nectarines/					Freestone peaches				
	Total sold for fresh use	Shipped out-of-state	Out of state as a percentage of total fresh use	Used within the state	Within the state as a percentage of total fresh use	Total sold for fresh use	Shipped out-of-state	Out of state as a percentage of total fresh use	Used within the state	Within the state as a percentage of total fresh use
	1,000 tons	1,000 tons	per cent	1,000 tons	per cent	1,000 tons	1,000 tons	per cent	1,000 tons	per cent
1924						34.4	21.0	61.0	13.4	39.0
1925						13.0	30.7	71.4	12.3	28.6
1926						34.1	18.7	54.8	15.4	45.2
1927						61.0	45.5	74.6	15.5	25.4
1928						23.8	56.8	13.1	38.6	59.2
1929						44.1	21.8	49.4	22.3	50.6
1930						92.9	60.2	64.8	32.7	35.2
1931						64.5	16.3	25.3	18.2	74.7
1932						65.2	26.6	40.8	38.6	59.2
1933						53.9	16.1	29.9	37.8	70.1
1934						18.9	17.4	35.6	31.5	64.4
1935						44.1	11.4	25.9	32.7	74.1
1936						56.8	21.0	37.0	35.8	63.0
1937						62.2	21.2	34.1	11.0	65.9
1938						66.8	20.7	31.0	46.1	69.0
1939						77.5	20.0	25.8	57.5	74.2
1940						79.8	22.3	27.9	57.5	72.1
1941						83.1	17.4	20.9	65.7	79.1
1942						103.2	28.0	27.1	75.2	72.9
1943						124.8	46.7	37.4	78.1	62.6
1944						140.4	50.5	36.0	89.9	64.0
1945						107.9	40.4	37.4	67.5	62.6
1946						134.5	52.2	38.8	82.3	61.2
1947						117.3	45.7	39.0	71.6	61.0
1948						113.6	46.2	40.7	67.4	59.3
1949						111.3	48.9	43.9	62.4	56.1
1950						118.1	44.2	37.4	53.9	45.6
1951						106.4	55.8	52.4	50.6	47.6
1952						119.7	65.0	54.3	54.7	45.7
1953						105.6	58.2	55.1	47.4	44.9
1954	12.1	6.4	52.9	5.7	47.1	117.0	60.5	51.7	56.5	48.3
1955	17.8	10.7	60.1	7.2	39.9	117.0	60.5	51.7	56.5	48.3
1956	23.1	13.6	58.9	9.5	41.1	127.6	83.0	65.0	44.6	35.0
1957	22.1	10.1	54.9	8.3	45.1	109.7	58.4	53.2	51.3	46.8
1958	35.2	22.5	63.9	12.7	36.1	70.0	56.7	81.2	5.0	16.8
1959	29.2	18.2	62.3	11.0	37.7	105.7	54.7	51.8	51.0	48.2
1959	37.6	26.5	70.5	11.1	29.5	111.7	53.8	48.2	57.9	51.8
1960	43.0	29.9	69.5	13.1	30.5	117.4	63.7	54.3	53.7	45.7

Pears (Bartlett)					Pears (other than Bartlett)					
1924	63.5	57.5	90.6	6.0	9.4	12.8	12.1	94.5	0.7	5.5
1925	89.4	82.5	92.3	6.9	7.7	11.8	11.1	94.1	0.7	5.9
1926	111.3	104.0	93.4	7.3	6.6	15.8	14.9	94.3	0.9	5.7
1927	91.9	82.4	89.7	9.5	10.3	16.8	15.4	91.7	1.4	8.3
1928	107.9	96.0	89.0	11.9	11.0	21.8	20.5	94.0	1.3	6.0
1929	92.8	79.8	86.0	13.0	11.0	16.7	15.0	89.8	1.7	10.2
1930	135.1	116.1	85.9	19.0	14.1	20.8	26.2	71.6	2.6	8.4
1931	105.9	84.9	80.2	21.0	19.8	24.8	22.7	91.5	2.1	8.5
1932	89.2	68.4	76.7	20.8	23.3	22.8	20.3	89.0	2.5	11.0
1933	68.6	50.7	73.9	17.9	26.1	22.8	20.3	89.0	2.5	11.0
1934	95.5	72.3	75.7	23.2	24.3	30.8	28.1	91.2	2.7	8.8
1935	76.2	53.8	70.6	22.4	29.4	17.4	15.2	87.4	2.2	12.6
1936	90.0	68.5	76.1	21.5	23.9	20.1	27.0	89.7	3.1	10.3
1937	94.6	77.6	82.0	17.0	18.0	23.3	20.7	88.8	2.6	11.2
1938	113.0	88.0	77.9	25.0	22.1	45.8	41.0	89.5	4.8	10.5
1939	86.7	62.6	72.2	24.1	27.8	29.8	24.2	81.2	5.0	16.8
1940	80.7	62.2	77.1	18.5	22.9	21.3	19.7	89.2	3.1	10.3
1941	71.1	49.9	70.2	21.2	29.8	6.3	2.8	44.4	3.5	55.6
1942	66.6	48.0	72.1	18.6	27.9	10.6	6.1	57.5	4.5	42.5
1943	109.3	86.2	78.9	23.1	21.1	17.2	13.1	76.2	4.1	23.8
1944	81.7	54.4	66.6	27.3	33.4	15.5	10.7	69.0	4.8	31.0
1945	137.1	107.2	78.2	29.9	21.8	24.9	17.6	70.7	7.3	29.3
1946	104.0	76.5	73.6	27.5	26.4	21.9	18.3	83.6	3.6	16.4
1947	101.4	76.5	75.4	24.9	24.6	27.2	23.0	84.6	4.2	15.4
1948	42.9	30.5	61.8	18.2	24.8	15.4	10.2	65.6	4.5	31.6
1949	117.1	95.3	81.4	21.8	18.6	16.6	9.8	59.0	6.8	11.0
1950	85.5	69.2	80.9	16.3	19.1	9.5	5.3	55.8	4.2	44.2
1951	80.5	64.0	79.5	16.5	20.5	16.6	11.7	70.5	4.9	29.5
1952	114.6	81.7	71.4	22.0	18.3	11.1	7.5	67.6	3.6	32.4
1953	69.4	53.9	77.7	15.5	22.3	12.0	8.0	66.7	4.0	33.3
1954	93.1	71.9	77.2	21.2	22.8	16.8	11.3	67.3	5.5	32.7
1955	68.4	52.3	76.5	16.1	23.5	13.7	8.7	63.5	5.0	36.5
1956	86.0	68.0	79.1	18.0	20.9	22.1	16.4	71.2	5.7	25.8
1957	94.1	74.7	79.4	19.4	20.6	21.1	15.0	74.1	6.1	28.9
1958	83.4	64.4	77.2	19.0	22.8	10.1	7.2	71.3	2.9	28.7
1959	88.9	69.8	78.5	19.1	21.5	18.4	15.2	82.6	3.2	17.4
1960	76.0	61.0	80.3	15.0	19.7	12.8	9.5	74.2	3.3	25.8

(Continued on next page.)

Appendix Table A.8--continued.

Year	Total sold for fresh use	Shipped out-of- state	Plums		
			Out-of state as a per- centage of total fresh use	Used within the state	Within the state as a per- centage of total fresh use
	1,000 tons	per cent	per cent	1,000 tons	per cent
1924	40.3	35.6	88.3	4.7	11.7
1925	50.8	44.5	87.6	6.3	12.4
1926	70.0	62.7	89.6	7.3	10.4
1927	55.5	49.0	88.3	6.5	11.7
1928	63.9	56.1	87.8	7.8	12.2
1929	37.8	32.5	86.0	5.3	14.0
1930	78.7	70.7	89.8	8.0	10.2
1931	56.2	47.6	84.7	8.6	15.3
1932	56.5	46.7	82.7	9.8	17.3
1933	47.9	40.4	84.3	7.5	15.7
1934	59.9	51.3	85.6	8.6	14.4
1935	45.6	37.0	81.1	8.6	18.9
1936	62.4	52.1	83.5	10.3	16.5
1937	62.7	50.5	80.5	12.2	19.5
1938	61.7	50.4	81.7	11.3	18.3
1939	62.3	48.3	77.5	14.0	22.5
1940	62.8	52.2	83.1	10.6	16.9
1941	64.0	50.4	78.8	13.6	21.2
1942	64.7	51.1	79.0	13.6	21.0
1943	68.4	54.0	78.9	14.4	21.1
1944	82.0	63.6	77.6	18.4	22.4
1945	63.5	49.6	78.1	13.9	21.9
1946	92.0	75.5	82.1	16.5	17.9
1947	70.9	57.5	81.1	13.4	18.9
1948	65.1	52.5	80.6	12.6	19.4
1949	77.5	59.2	76.4	18.3	23.6
1950	73.1	59.9	81.9	13.2	18.1
1951	91.0	70.9	77.9	20.1	22.1
1952	50.6	39.5	78.1	11.1	21.9
1953	75.0	60.5	80.7	14.5	19.3
1954	64.2	51.3	79.9	12.9	20.1
1955	80.5	65.6	81.5	14.9	18.5
1956	91.8	75.8	82.6	16.0	17.4
1957	75.1	62.7	83.5	12.4	16.5
1958	56.7	46.3	81.7	10.4	18.3
1959	85.3	70.1	82.2	15.2	17.8
1960	76.8	65.0	84.6	11.8	15.4

a/ Apple data not available prior to 1934.

b/ Bushels converted to tons by multiplying by .024. One bushel equals 48 pounds.

c/ Apple data not available for 1960.

d/ Nectarine data not available prior to 1953.

Sources:

All years prior to 1955: California Crop and Livestock Reporting Service, California Fruit and Nut Crops, 1909-1955: Acreage, Production, Utilization, Value, Special Publication No. 261 (Sacramento, July, 1956), pp. 14, 18, 24, 35, 79, 86, 89, and 96.

Years from 1955 through 1960: California Crop and Livestock Reporting Service, California Fruit and Nut Crops (Sacramento, May 1, 1960), pp. 3-5 and May 1, 1961, pp. 3-5.

Years from 1955 through 1959 (apples only): U. S. Agricultural Marketing Service, Interstate Shipments of California Delicious Tree Fruits, 1960 (San Francisco, 1961), p. 10.

Appendix Table A.9

Gross Returns Per Ton—Fresh and Various Processed Uses—California
Deciduous Fruits, 1924-1960
(Dollars per ton, fresh weight at grower's first delivery point.)

Year	Apples				Apricots			Cherries			Grapes (all varieties)			
	Fresh	Canned	Dried	Crushed dollars	Fresh	Canned	Dried	Fresh	Canned	Brined	Fresh dollars	Canned	Dried	Crushed
1924	34.20	b/	18.75	10.80	54.10	60.00	17.80	151.00	114.00	110.00				
1925	43.80		25.00	13.30	66.20	60.00	60.90	165.00	153.00	153.00				
1926	19.20		11.67	6.70	53.90	70.00	67.30	195.00	165.00	165.00				
1927	41.70		23.34	12.50	64.40	65.00	52.70	189.00	165.00	160.00				
1928	25.00		12.50	10.80	54.60	18.00	50.90	151.00	150.00	140.00				
1929	59.20		22.92	12.10	62.20	70.00	60.00	196.00	185.00	181.00				
1930	23.80		7.92	5.00	51.00	38.00	38.20	155.00	140.00	110.00				
1931	27.10		9.58	8.30	26.50	25.00	30.20	109.00	75.00	50.00				
1932	15.00		4.58	2.90	18.00	17.00	18.20	61.10	61.00	56.00				
1933	26.70		10.42	8.30	26.90	28.00	30.20	61.10	72.00	70.00				
1934	24.20		12.92	7.10	47.20	61.00	52.70	80.00	110.00	102.00	21.40	20.00	16.00	16.10
1935	20.00		8.75	7.10	42.40	53.00	43.10	121.00	140.00	125.00	16.70	18.00	13.95	10.00
1936	22.10		11.25	8.30	34.00	31.00	40.00	104.00	109.00	95.50	23.80	25.00	17.40	17.10
1937	19.60		5.00	4.60	46.10	42.00	33.40	171.00	175.00	165.00	25.60	27.00	15.70	18.60
1938	18.80		6.25	5.00	29.80	23.00	39.30	95.10	69.00	71.00	22.20	21.00	10.50	10.60
1939	20.00	6.20	6.25	5.00	37.20	27.00	34.00	82.00	79.00	75.00	17.40	15.00	12.10	13.20
1940	20.80	7.50	4.15	4.60	66.60	62.00	44.60	150.00	135.00	120.00	20.90	17.90	14.40	13.20
1941	32.50	14.20	15.80	9.60	49.00	45.00	45.10	131.00	138.00	117.00	28.29	25.00	21.40	19.90
1942	60.00	29.20	27.50	22.10	69.40	64.00	71.80	153.00	152.00	136.00	47.30	34.00	28.25	30.30
1943	97.90	56.30	56.30	20.10	132.00	102.00	120.00	301.00	240.00	196.00	109.00	49.00	41.00	77.60
1944	94.20	72.90	54.20	27.10	141.00	110.00	115.00	315.00	278.00	238.00	113.00	55.00	50.00	100.00
1945	114.00	102.00	62.50	18.80	132.00	110.00	115.00	304.00	278.00	260.00	71.10	62.00	50.75	55.10
1946	91.20	72.90	43.80	20.80	122.00	97.00	109.00	320.00	300.00	298.00	109.00	75.00	78.00	90.70
1947	42.90	31.30	11.70	11.30	93.60	73.00	87.30	265.00	238.00	235.00	50.90	57.00	33.00	29.80
1948	61.20	39.60	18.80	17.90	68.50	57.00	76.00	349.00	329.00	310.00	52.10	48.50	33.50	30.30
1949	36.20	27.50	14.60	13.80	67.00	52.00	90.00	214.00	190.00	111.00	39.40	38.70	33.70	26.80
1950	60.00	45.80	37.50	27.10	120.00	68.00	114.00	320.00	211.00	215.00	75.40	65.00	65.20	61.00
1951	61.20	44.70	35.40	20.80	129.00	115.00	112.00	444.00	350.00	300.00	48.50	63.00	44.70	30.90
1952	68.80	39.00	31.30	20.80	142.00	94.00	133.00	348.00	204.00	153.00	51.50	49.00	39.00	25.60
1953	99.60	70.80	58.30	45.80	140.00	94.00	133.00	348.00	204.00	153.00	51.50	49.00	39.00	25.60
1954	87.50	60.40	58.30	27.10	152.00	102.00	118.00	384.00	333.00	277.00	64.60	62.00	43.75	38.50
1955	70.80	44.70	33.30	20.80	151.00	89.50	125.00	311.00	273.00	195.00	56.30	50.00	43.00	30.10
1956	89.33	58.33	54.17	33.33	184.00	112.00	162.00	351.00	260.00	223.00	69.00	54.00	49.00	38.80
1957	66.67	47.92	37.50	27.08	122.00	88.00	134.00	351.00	276.00	233.00	72.00	63.00	66.00	50.90
1958	64.58	39.58	33.33	27.08	142.00	102.00	122.00	482.00	376.00	336.00	80.80	80.00	78.80	48.90
1959	81.10	51.20	35.40	25.40	121.00	85.00	173.00	397.00	371.00	355.00	68.60	59.00	49.00	42.90
1960	95.80	61.50	37.00	62.00	136.00	87.00	138.00	438.00	388.00	303.00	67.80	54.00	53.50	38.80

(Continued on next page.)

Appendix Table A.9--continued.

Year	Nectarines		Freestone peaches			Pears (Bartlett)			Pears (other than Bartlett)		Plums	
	Fresh	Processed	Fresh	Canned	Dried	Fresh	Canned	Dried	Fresh	Canned	Fresh	Canned
			dollars						dollars			
1924			28.00	23.00	19.25	86.50	52.00	148.70	96.70		82.30	26.00
1925			32.70	34.00	32.08	143.80	66.00	143.60	69.10		57.00	30.00
1926			30.00	33.00	38.50	38.10	38.00	26.60	148.50		35.20	24.00
1927			36.20	22.00	24.75	65.10	142.00	31.60	87.90		65.50	28.00
1928			23.30	18.00	50.00-92	50.00	37.00	29.80	54.40		54.20	23.00
1929			35.50	35.00	44.85	81.50	12.00	145.40	71.50		101.00	52.00
1930			25.00	20.00	13.54	25.00	29.00	20.40	20.90		36.10	19.00
1931			20.00	16.00	16.08	36.00	17.00	20.10	31.70		29.40	14.00
1932			9.60	12.00	10.15	15.50	14.00	15.60	11.50		18.90	15.00
1933			19.30	17.00	18.62	28.90	17.00	20.00	20.20		26.10	17.00
1934			22.00	22.00	21.15	36.60	35.00	24.70	27.90		33.00	25.00
1935			27.00	23.00	22.85	31.80	29.00	24.00	33.10	20.00	13.20	29.00
1936			28.10	22.00	22.85	30.20	24.00	22.20	27.20		28.70	28.00
1937			28.60	28.00	18.62	34.60	23.00	17.80	33.30	20.00	147.50	34.00
1938			19.70	16.00	16.00	12.70	11.00	18.90	11.60		25.70	19.00
1939			20.00	18.00	19.38	31.40	27.00	24.00	15.90		34.60	19.00
1940			19.70	18.50	16.62	28.40	28.00	20.00	18.10	14.80	14.30	14.00
1941			35.50	26.00	30.00	143.50	141.80	25.40	39.00	37.00	50.50	38.00
1942			54.30	10.00	12.31	71.30	63.00	145.45	60.00	62.00	77.80	50.00
1943			105.00	55.00	47.70	99.00	64.00	60.00	102.00	64.00	161.00	60.00
1944			93.30	55.00	70.50	103.00	80.00	61.80	93.10	80.00	95.30	58.00
1945			93.90	57.00	73.20	88.30	72.00	65.00	95.00	73.00	119.00	55.00
1946			106.00	59.00	51.40	96.00	100.00	68.00	98.90	93.00	113.00	70.00
1947			63.50	40.00	30.00	61.20	73.00	50.00	65.40	66.00	127.00	57.00
1948			69.00	50.00	16.50	119.00	120.00	70.00	68.80	101.00	116.00	60.00
1949			34.80	34.20	31.00	33.40	31.00	15.80	29.60	20.00	73.10	140.00
1950			90.20	60.00	61.20	84.00	72.00	69.10	72.00	66.00	119.00	50.00
1951			81.80	61.00	49.00	104.00	97.00	64.00	61.50	81.60	111.00	51.00
1952			82.00	53.00	61.00	61.00	45.00	61.80	59.30	38.00	211.00	40.00
1953			65.00	49.00	58.00	88.10	67.00	65.90	57.00	65.00	124.00	57.00
1954			75.30	48.00	58.00	82.90	70.00	105.00	79.10	68.00	143.00	54.00
1955			88.50	59.80	65.00	96.20	70.30	70.00	58.30	64.80	139.00	54.00
1956	150.00	71.40	66.00	60.00	72.00	83.40	75.00	67.00	83.20	70.30	110.00	33.00
1957	150.00	54.00	77.30	45.00	57.10	78.60	61.00	76.00	61.20	56.00	169.00	33.00
1958	151.00	63.00	70.50	47.00	62.90	83.80	85.00	124.00	67.30	82.90	173.00	38.00
1959	116.00	68.00	57.00	44.00	54.30	80.90	61.20	98.00	78.00	57.10	124.00	44.00
1960	107.00	66.60	61.00	40.10	51.40	101.20	78.60	98.00	87.90	74.60	158.00	47.00

-157-

a/ Prices per bushel converted to prices per ton by multiplying by 41.667, as one ton contains 41.667 bushels.

b/ Blanks indicate data not available.

Sources:

Years from 1924 through 1955: California Crop and Livestock Reporting Service, California Fruit and Nut Crops, 1909-1955: Acreage, Production, Utilization, Value, Special Publication No. 261 (Sacramento, July, 1956), pp. 15, 19, 25, 36, 80, 87, 90, and 97.

Years from 1956 through 1960: California Crop and Livestock Reporting Service, California Fruit and Nut Crops (Sacramento, May 1, 1960), pp. 3-5 and May 1, 1961, pp. 3-5.

Years from 1956 through 1960 (for apples only): California Crop and Livestock Reporting Service, California Fruits, Annual Summary issues 1960, p. 4; 1958, p. 4; and 1957, p. 4.

Appendix Table A.10

Average Gross Returns Per Ton to Growers of Selected Deciduous Fruits, United States and California, 1924-1960^a

Year	Apples ^b		Apricots		Sweet cherries		Grapes (all varieties)		Peaches (all varieties)		Peanut		Pears ^b		Plums	
	United States	California	United States	California	United States	California	United States	California	United States	California	United States	California	United States	California	United States	California
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
	Dollars per ton															
1924	51.45	71.25	— ^c	52.30	— ^c	110.00	37.90	11.50	51.58	22.50	65.12	72.50	87.30	95.20		
1925	52.50	71.92	—	61.80	—	160.00	33.10	19.80	65.12	34.58	61.67	52.92	67.30	69.40		
1926	36.67	20.12	—	68.00	—	180.00	26.40	23.90	44.17	37.92	12.50	37.50	46.30	48.90		
1927	61.67	40.12	—	57.30	—	180.00	21.00	21.80	58.00	38.08	65.00	57.50	76.60	79.00		
1928	45.42	23.33	—	51.10	—	150.00	20.10	16.10	42.92	21.58	50.83	44.17	64.10	67.80		
1929	57.92	47.50	64.80	64.10	—	190.00	17.30	23.80	62.08	44.17	71.25	73.13	107.00	113.00		
1930	42.92	20.12	40.59	40.30	—	118.00	19.50	16.30	41.67	20.83	55.00	55.00	48.30	49.40		
1931	26.67	22.08	30.16	30.10	—	93.00	22.60	20.20	25.00	19.58	32.08	29.17	40.00	41.80		
1932	25.42	13.75	19.08	18.90	—	60.00	13.10	11.70	25.00	12.50	20.12	14.58	29.90	30.90		
1933	32.92	19.58	30.16	30.10	—	66.00	18.00	16.10	31.33	20.12	22.33	22.50	36.80	37.00		
1934	36.67	21.67	51.20	55.00	—	90.50	19.80	17.50	37.92	35.83	33.33	33.33	41.70	41.80		
1935	30.00	18.33	46.77	46.30	—	125.00	11.90	12.90	37.08	26.25	30.83	29.58	51.70	53.00		
1936	13.33	20.83	38.98	38.30	—	101.55	21.40	19.10	41.67	26.67	32.92	26.25	41.00	41.80		
1937	26.67	17.92	38.57	37.60	—	169.75	20.40	19.00	43.33	25.42	31.67	28.75	56.60	58.10		
1938	34.17	18.75	36.00	36.60	75.70	84.80	11.50	12.80	32.08	30.00	23.75	13.75	37.60	37.30		
1939	26.67	17.08	31.40	31.60	82.70	79.30	15.90	13.70	31.17	22.08	30.83	26.67	44.90	46.00		
1940	33.33	17.50	50.30	53.60	111.00	111.00	17.20	15.60	32.92	21.67	30.63	25.83	51.90	53.00		
1941	40.00	27.50	46.00	46.10	117.00	117.00	21.10	22.40	37.92	35.83	42.92	40.12	63.00	63.20		
1942	57.08	41.33	71.20	69.90	111.00	118.00	35.60	33.40	68.50	51.25	64.58	61.17	91.80	93.40		
1943	99.58	61.25	132.00	121.00	230.00	270.00	62.20	60.70	112.08	98.17	98.33	77.92	169.00	169.00		
1944	81.33	80.00	110.00	108.00	275.00	290.00	72.20	71.80	95.83	88.75	92.08	87.08	118.00	117.00		
1945	120.12	90.83	119.00	118.00	272.00	282.00	68.20	68.60	92.08	87.50	92.08	87.08	138.00	138.00		
1946	95.42	106.00	108.00	108.00	340.00	340.00	72.20	70.50	86.67	82.50	103.75	95.83	135.00	137.00		
1947	74.58	38.75	89.00	86.40	256.00	251.00	39.30	36.00	67.08	55.00	82.50	73.75	154.00	157.00		
1948	92.50	50.83	69.00	68.20	276.00	286.00	38.50	35.60	88.00	70.42	110.00	114.00	150.00	150.00		
1949	57.50	33.75	72.50	76.20	156.70	156.70	35.70	32.50	56.67	50.00	100.00	100.00	100.00	100.00		
1950	65.42	56.25	95.10	94.70	238.00	272.00	68.20	65.00	85.12	88.75	89.17	75.00	172.00	180.00		
1951	74.17	55.42	121.00	120.00	297.00	361.00	10.10	37.60	88.17	78.75	101.25	95.00	112.00	114.00		
1952	106.67	61.85	115.00	114.00	210.00	221.00	79.60	76.90	81.75	82.92	90.83	89.58	171.00	171.00		
1953	110.83	81.58	119.00	116.00	229.00	274.00	48.30	43.10	78.75	71.67	81.58	71.67	156.00	161.00		
1954	93.75	73.13	126.00	123.00	290.00	336.00	50.90	45.90	83.75	75.00	87.92	74.58	172.00	179.00		
1955	82.08	56.25	105.00	107.00	215.00	267.00	42.20	38.60	90.83	89.58	91.67	88.75	171.00	171.00		
1956	98.33	76.25	131.00	131.00	303.00	303.00	48.30	48.30	81.33	81.33	91.67	88.75	171.00	171.00		
1957	77.50	62.08	108.00	108.00	309.00	285.00	61.70	59.10	87.91	73.75	91.67	88.75	171.00	171.00		
1958	59.58	42.92	151.00	160.00	296.00	315.00	67.10	63.30	79.58	71.25	76.33	88.58	159.00	162.00		
1959	68.33	49.17	117.00	115.00	315.00	315.00	54.20	51.50	77.17	67.92	71.67	67.92	155.00	155.00		
1960	91.67	69.58	105.00	104.00	361.00	366.00	54.70	48.90	77.50	63.33	89.58	83.75	187.00	192.00		

^a Net returns not included, as California prices only are reported.^b Prices per bushel converted to prices per ton by multiplying by 41.667. One bushel = 48 pounds. One ton contains 41.667 bushels.^c Dashes indicate data not available.

Sources:

U. S. Bureau of Agricultural Economics, Fruits (Non-citrus) Production, Farm Disposition, Value and Utilization of Sales, 1889-1944, May, 1948, 106p.Ibid., 1945 through 1952, annual issues.U. S. Agricultural Marketing Service, Fruits (Non-citrus) Production, Farm Disposition, Value and Utilization of Sales, 1953-1960, annual issues.

APPENDIX B

Additional Data Relating to Functions and Practices of Interviewed Firms

Financing

By First Handlers.--Most of the first handlers interviewed advance funds to growers during the harvest season to cover their labor costs. No interest is charged on these advances and they are deducted from fruit returns. In general these are "open account" charges, although if harvest is in progress fruit already delivered provides the basis.

Only four firms interviewed operated supply stores in connection with their packinghouses. Three of these were cooperatives. More than 90 percent of the interviewed firms allow their growers' suppliers to charge spray and fertilizer purchases to the first handler. The handlers generally carry the growers' accounts until the harvest season without interest and deduct the charges from fruit returns.

Practices relating to production financing vary widely among firms and districts. In the Coachella, Bakersfield, and to some extent in the Fresno-Dinuba districts, first handlers often furnish labor crews for many of the production operations and may provide supervision for those crews. The amount of production work done by handlers engaged in this practice varies from all operations to harvesting only. If this labor is furnished as early as the pruning season, the packing organization usually bills the grower either weekly or monthly. If payment is not made within the specified terms of the agreement, an interest charge may be made, although this is rarely done. Firms furnishing labor solely for thinning and/or harvesting usually deduct these charges from grower returns for fruit marketed and no interest is charged.

First handlers who furnish and pay for labor, starting as early as the pruning season, generally have some type of written contract with the grower. Usually this specifies that the grower market all of his fruit, or a specific part of it, through the financing firm. Other provisions cover charges to be made and obligations of the handler.

In some districts, commercial handlers traditionally finance a large part of some of their growers' operations. In many of these cases a marketing contract and a crop mortgage are required, and interest is charged until harvest begins.

Cooperatives generally do not furnish production advances other than for supplies purchased. Only one cooperative interviewed furnished labor crews for its members, and it required weekly payments for costs incurred.

By California Sales Agencies.--All of the sales agencies contacted extend credit to their first-handler accounts for supplies and harvesting costs. Those operating packinghouses provide grower financing as discussed above.

Credit extended to first handlers is largely in the form of advances to cover seasonal operating costs, and no interest is charged. Sales organizations sometimes grant loans for purchase of land or the building of facilities by first handlers; however, furnishing this type of long-term financing is not a common function of most agencies. These loans are limited largely to accounts which have long been associated with the agency and generally are used to expand production, packing, or storage capacity in areas considered desirable for growth by the sales firm.

The amount of credit extended by sales agencies varies widely among producing districts. In some districts agency representatives indicated that almost all growers were financed by sales firms. Two sales organizations financed the production of about 50 percent of their growers in some districts. One firm indicated that about one-third of the growers to which it extends credit could not get sufficient financing from traditional lending institutions such as banks or production credit associations.

Pooling and Payment Systems--First Handlers

Other than grower-shippers packing only their own fruit, about half of first handlers interviewed use pooling arrangements for all or a majority of their fruit. The remaining firms keep individual grower lots separate. Pooling is much more common in the tree fruit districts than in the grape districts, and particularly among the cooperatives. Firms handling a number of tree fruit varieties may pool some and maintain separate lot identification for others. In the grape districts most of the handlers, including cooperatives, keep the lots separate; although in the latter districts some pooling is done, particularly with storage varieties.

When pooling is used, the length of the pooling period depends largely on the nature of the commodity. In early districts where time of harvest is a major factor, pools may be daily or by individual car. In late districts and for storage fruit, pools are usually seasonal. Separate pools for each variety, grade, and size are usually used. Some packinghouses sample the fruit upon delivery to determine percentages of grade, size, and other specifications for pooling and payment purposes; and all fruit is then handled as a single lot in the packing and shipping operations. Others keep lots separate until each lot is packed and a tally is made of the various specifications, and then it is comingled with other lots in cars or storage.

Payment systems vary with the extent of pooling used. If fruit is maintained in separate lots, returns to growers are often made as soon as the shipper receives payment from the buyer or sales organization. This is also the case if pools are on a car or daily basis. Payment for fruit in longer period pools such as weekly or seasonal is generally made at the end of the period involved, although even if the pool is shorter than seasonal payment may not be made until the end of the season. This often depends upon the method used for determining packing costs and other charges to be deducted. Some first handlers pay growers within a specified time from the date of delivery to them regardless of their own receipt of payment from buyers. Firms that do not return fruit proceeds until the end of the season, or some other relatively long period, usually have an established procedure for advancing some portion of the expected returns based on fruit delivered or shipped.

